AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

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Suggested Method for Filing Sample Dyeings

Present Systems of Dye Manufacturers Lack Uniformity and Do Not Permit Easy Comparisons of Various Type Brands—How One Laboratory Overcame This, and an Invitation to Dyestuff Firms to Co-operate

By E. W. ADAMS

Chemist, Lewiston Bleaching & Dye Works, Lewiston, Me.

EVERY textile chemist who has anything to do with dyestuffs receives, from time to time, announcements, folders, color cards and similar advertising material from manufacturers of dyestuffs. Books and pamphlets may be filed in bookcases; circulars may be filed—but much of the material cannot be made to fit into permanent records and thus become a help both to the chemist or dyer and dyestuff manufacturer.

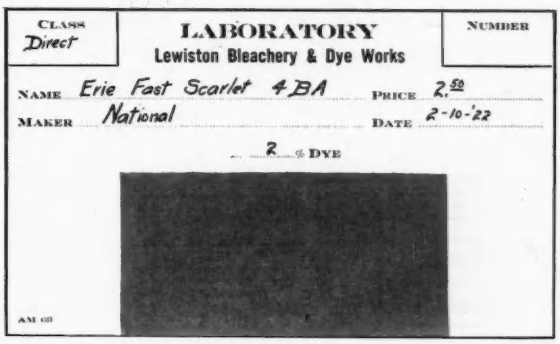
The German manufacturers, through their comprehensive encyclopedias of dyeing and pocket manuals, did much to help the mills. Several of our larger American manufacturers of dyestuffs are placing loose leaf binders, containing valuable information regarding their products, among the mills, and mill men appreciate the efforts which these manufacturers are making to give detailed and accurate information.

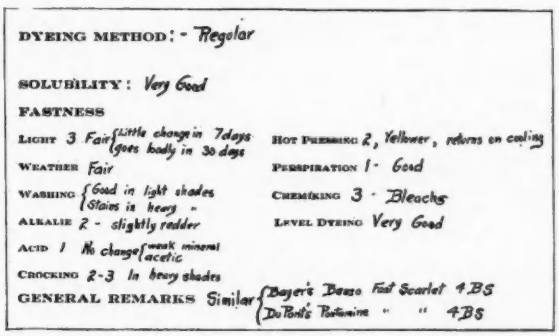
Limitations of Present Systems

The one criticism here offered is that books or loose leaf folders do not permit a comparison of the dyeing of one dyestuff with another similar color. During the past four years we have worked out a card system for filing dyeings of colors submitted to us. The cards are filed under classes of dyestuffs, and under colors they are filed alphabetically by the name of the dyestuff. While we are primarily interested in dyestuffs for cotton piece goods, this system can easily be modified to meet the needs of other branches of the textile industry.

Under "Class" we list basic, developed, direct, sulphur, vat, special. This could easily be expanded to meet the needs of the wool and silk industry.

Under "Number" we formerly gave every sample of dyestuff received a number. Samples from Bayer were: "By. 1, 2, 3." etc.; from Cassella: "C. 1, 2, 3," etc., and other firms similarly. With the advent of so many small American manufacturers and jobbers we have temporarily discarded that method of filing samples of dyestuffs, and now file the samples by colors, alphabetically. Eventually we shall go back to the old method. By this method the dyestuff wanted can be found instantly.




DYEING METHOD: - Regular
SOLUBILITY: Very Good
FASTNESS
LIGHT 3 Fair (Little change in 7 days goes badly in 30 days
HOT PRESSING 2, Yellower, returns on cooling
WEATHER Fair
PERSPIRATION 1 · Good
WASHING (Good in light shades Stains in heavy "
CHEMICKING 3 · Bleachs
ALKALIE 2 - slightly redder
LEVEL DYEING Very Good
ACID 1 No change (weak mineral acetic
CROCKING 2-3 In heavy shades
GENERAL REMARKS Similar (Bayer's Benzo Fast Scarlet 4BS
(DuPont's Pontamine " " 4BS

The above specimen card, together with that on the following page, show how this system meets the requirements of two classes of cotton colors

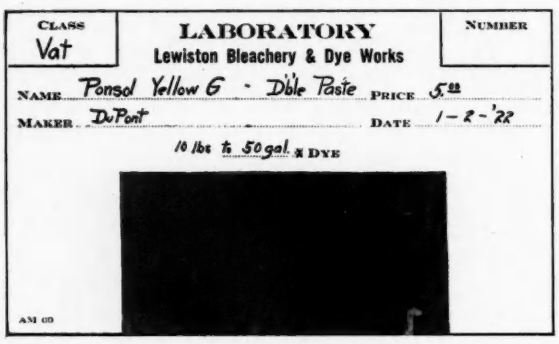
How to Obtain Satisfactory Comparisons

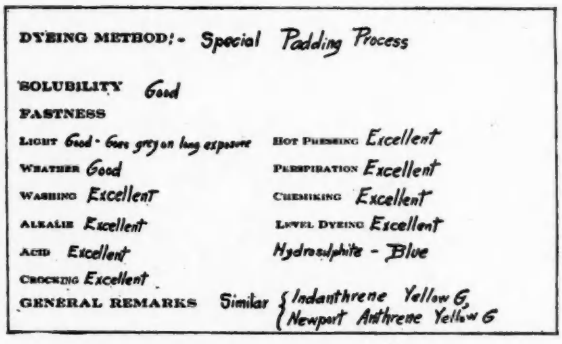
The space for pasting the sample on the card was made purposely at the bottom in order that similar dyeings might be compared by simply superimposing one card upon another.

For (a)—sulphur and also (b)—developed colors, we divide the space in two, so that (a) we may have a swatch of the sulphur color after-treated and (b) that we may have a swatch of the color developed.

A Suggestion

We would suggest the consideration by the manufacturers of dyestuffs of a plan to use a card system for sending out information concerning their offerings. We have used our system merely as an illustration of a possible method. A larger card could be used advantageously. Such a card could show dyeings on the several fibers. In any case, however, the swatches should be so arranged that they may be compared with swatches of a similar dye on another card.





The above illustration, showing front and back of a specimen card, may be compared with that on the preceding page for an example of convenience of comparison

Our dyeing methods are standardized and are similar to those which have been so well given by Scott,[1] Estey[2] and Hayes.[3]

We test for fastness of the color by the methods outlined in Schultz's "Farbstofftabellen" (1914 Edition) and similarly in Hoechst's "Pocket Manual" (1911). Our sulphur khaki shades are subjected to the tests required by the Army Department in their purchases. There is no ned to elaborate on them here, since these tests for fastness are probably available to most textile men.

Standardized Information from Dye Manufacturers

If I remember correctly, an editorial appeared in the American Dyestuff Reporter during the Spring of 1920 which suggested a standardized system for the supplying of information by the manufacturers of dyestuffs to the mills.*

Such a plan should appeal to dyestuff manufacturers. The Congressional Library supplies cards to other libraries, and this is a valuable service. Could our new American Association of Textile Chemists and Colorists maintain a bureau or clearing house to put out information concerning dyestuffs, or could our manufacturers of dyestuffs use the same methods of dyeing and tabulating the properties of their colors, a valuable service would be rendered to the mills.

The present method of sending out all sizes, shapes, and varieties of pamphlets and announcements does not give a maximum of usefulness to either the mills or dyestuff manufacturers.

Advantages of Standardization

A system as partially outlined would bring information to the textile chemist or dyer in a thoroughly practical way:

(a) A card system is the simplest and easiest way of filing any information.

(b) The system easily expands to take in new colors as they are placed upon the market. Books of dyeings and pamphlets do not; the collection of pamphlets accumulates.

(c) Essential information about and properties of each color are available in condensed form.

(d) Similar colors from different manufacturers can be easily compared by placing one dyeing upon the dyeing on another card.

(e) Similar systems of filing dyeings are in operation in other mills.

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*Mr. Adams evidently refers to "What of the Future?" by Louis A. Olney, this Journal, September 13, 1920, p. 11.—Ed.

[1] Dr. Walter M. Scott, American Dyestuff Reporter, Vol. 7, No. 15; October 11, 1920

[2] P. F. Estey, American Dyestuff Reporter, Vol. 8, No. 1; January 3, 1921

[3] Louis Hayes, "Color Trade Journal," Vol. X, No. 2; February, 1922

Dyeing Wool as Raw Stock

By RALPH J. BATTYE

A Paper Presented at the Twenty-first Annual Meeting of the Alumni Association of the Philadelphia Textile School

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RAW stock dyeing is utilized extensively to-day because of the popularity of the so-called mixes and blends. It has always held its place in the making of this character of yarn and is an essential process linked in with wool yarn manufacture. The manufacture of worsted blends will not be considered in this paper, although this processing is similar in many respects to the blending of raw stock except it is done in the top.

Production and quality of work in the handling of raw stock depends to a large extent on the skill of the individual dyer. The first and most important consideration is to work with clean wool, that is, with wool thoroughly scoured and washed free from all impurities. Dirty or greasy wool will lead to uneven dyeing. Also, if the wool fibers are to be preserved in their natural condition with as many of the original properties as possible intact, it can be seen that correct methods of handling must be employed.

The wool is delivered to the dyer in batches or "sheets." If the scouring is done at the same plant it may be delivered wet, in which case it is important that the amount of moisture present be known.

The oldest style of dyeing apparatus for raw stock wool dyeing is the open tub or kettle. This is still in practical use and is generally conceded to give the best results even to the present day when compared with the machines attempting to replace it.

These tubs are almost always circular wooden kettles held together with iron bands around the circumference. The kettle has a false, perforated bottom. This false bottom is practically a wooden floor in which holes are bored, or consists of perforated iron segments resting on two steam pipes set at right angles to each other but drawing steam from the same line. The steam pipes are on the bottom of the kettle and under the false bottom. These steam pipes are made as a cross and along their length are perforated to allow the steam to escape in the bath in a horizontal or downward manner. This last point is important as it promotes even dyeing because the liquor in the tub is heated in a more uniform manner and the steam prevented from directly striking the stock. The false bottom also prevents the raw stock clogging the steam pipe and there is no loss of stock when draining the kettle.

The plug for draining is in the bottom of the kettle and beneath the false bottom. Connected to the plug is a long iron rod which extends to the top of the kettle. This acts as a handle, is usually encased in wood, and prevents the stock from running through the outlet during the draining of the kettle.

The kettles or tubs are usually set partially below the floor level, according to the depth of the kettle, the height above the floor being such as to make the working of the stock convenient to the men. Two or three men are required to work the wool. On a two hundred pound kettle, two men are used. The stock is worked with wooden poles about twelve feet in length and of about six inches in diameter at the center, tapering down to three or four inches at the end. The process of working the stock is called "poling" and is carried out as follows: If two men are working they keep directly opposite one another on the opposite sides of the kettle. Each man puts his pole down along the side of the kettle to the false bottom and then, sliding them on the bottom, the poles are brought up at the center, touching one another. When the poles are thus raised clear of the dye liquor, the stock is shaken off or rolled over by rolling the pole. In this way the material is moved through the liquor and even shades obtained. The men poling the stock keep following one another completely round the kettle.

Tubs vary in size but are seldom built to hold more than five hundred pounds of stock. The average size kettle is made for dyeing about two hundred pounds of material. It would be made of three inch wood, would be six feet in diameter and four feet deep, inside dimensions. The false bottom would be about six inches from the bottom. The water supply is derived from a line piped to the top of the kettle.

For the dyeing of this class of material, colors of maximum fastness to light, washing, etc., are required. It is therefore necessary to use chrome colors applied by one of the following methods, depending on the character of the dyestuffs employed:

1. Chrome mordant or bottom chrome method.
2. Chromate method.
3. After-chrome or top chrome method.

In the bottom chrome method, the first operation is the chroming. Some colors are only applicable by this method of first chroming the material, carried out by adding the requisite amount of water to the kettle, usually to within about one foot of the top of kettle, this allowing room for the stock and for condensation of steam as kettle is heated. To this water is added, based on the

weight of material, 3 per cent of potassium or sodium dichromate (commonly called chrome) and 3 per cent of lactic acid or cream of tartar as an assistant. Lactic acid is usually used for dark shades while cream of tartar would find use for mordanting for light shades. The kettle is raised to the boil, the stock entered, worked for a short time and then allowed to remain in the boiling bath for one hour. The liquor is then run out and the wool washed well in preparation for its subsequent dye bath. In this process the wool has been mordanted with a hydroxide or hydrated oxide of chromium which gives the material an affinity for the dye which it originally did not possess.

Colored shoddies are partially stripped in a very similar manner to the above chroming process. The treatment in this case is more severe, 4 per cent sulphuric acid and 7 per cent of sodium dichromate being used, liberating the strong oxidizing agent, chromic acid, which does the stripping by destroying or partially destroying the color on the shoddy. This treatment permits the dyeing of dark shades with this class of material, whereas if stripping was not resorted to, blacks only could be dyed. Aside from stripping, the treatment simultaneously acts as a chroming bath and the shoddy is subsequently dyed on the chrome mordant deposited in the material.

Dyeing on the Chrome Bottom

Water to the depth of eighteen inches is run into the kettle and the dyestuff added. The bath is then boiled until the dye is thoroughly dissolved. Cold water is then run in to within one foot of the top of the kettle which reduces temperature to 110-112 deg. Fahr. If acetic acid is to be used in the dyeing it is now added. The wool is thrown in and pushed down in the liquor with long handled forks. It is kept in motion by the poling described above and after working five minutes, the steam is turned on and the temperature slowly raised to the boil. The liquor should not be brought too quickly to the boil, if even shades are to result. While raw stock does not have to be perfectly even, it must possess a degree of regularity. When the boil is reached, the steam is shut off for five minutes and then turned on again and wool boiled one and one-half hours. A sample is then taken, carded and compared with the shade desired.

Logwood is a typical dye applied by the chrome bottom process. The wool is chromed, washed and entered into a bath of about 330 per cent of Hematine paste along with violet, brown or other toning colors for shading the black. A small percentage, about 1 per cent, of Ammonia water could be added to keep down acidity of bath. The Logwood dye bath is started at the boil and boiled two hours, the kettle drained and the wool "smothered" for twelve hours. Logwood is a level working dye and thus can be started at the boil and still produce even dyeings.

When using the chromate method, the bath is made up in a similar manner as explained in the dyeing on a chrome mordant. In this method the material is not mordanted first but the sodium or potassium dichromate is added directly to the dye bath with addition of ammonia and acetic acid so that the dyeing and fixing of the color takes place at the same time. Samples are taken after one and one-half hour boiling.

For chrome top method, the dyeing takes place in a similar manner but the additions of ammonia and chrome to the dye bath is omitted. As assistants to the dyeing, 20 per cent Glauber's salt and 1 per cent sulphuric acid or its equivalent of acetic acid is added. The dyeing starts at low temperatures, raised to the boil and after boiling one hour the bath is allowed to cool to 160 deg. Fahr. Chrome is then added in an amount of about one-half the quantity of dye used, the bath again raised to the boil and boiled about one hour. This treatment with chrome develops and fixes the color.

Additions can be made directly to the dye baths if either the chrome bottom or chromate methods are employed, but in the case of the chrome top method, a fresh bath must be made up. The wool is usually boiled one-half hour after an addition of dye is made but the time would vary with the conditions.

After the material has been passed as to shade, the plug is lifted, allowing the liquor to drain out. The stock is then washed by allowing cold water to flow in the tub and then draining again. It is then thrown out of the tub into a box cart by hand or with forks, carried to the extractor and then to the dryer of the usual continuous type. After drying, the stock is ready for the pickers and cards.

Dyed stock is the hardest problem of the carder in producing yarn. Care must be taken in scouring and dyeing raw stock as lack of softness in the finished fabric could be traced to faulty processing in these preliminary processes. It must be kept in mind that there is a possibility of spoiling the finished fabric before the yarn is made. Raw stock if subjected to an unusually hard boil will mat together or felt. Felting is the usual fault, making it almost impossible to card the material without breaking the fibers and rubbing the stock into little pills which appear in specks of color in the finished yarn, whereas the color should have been evenly blended. Another fault which is a close second to the felting, is "burning" the fiber, in which the elasticity has been largely reduced and where it is impossible to spin the wool into yarn within perhaps 30 per cent of its actual value.

Naturally, the above method for dyeing raw stock by hand is laborious and machine dyeing has been suggested and is being used to increase production and reduce labor costs. These machines are of various types and possess capacities as high as twelve hundred pounds in one dyeing.

Some are based on the principle of keeping stock stationary, being fitted with centrifugal pumps and supply tanks, the liquor being forced through the tightly packed

material. Others like the Hussong machine are provided with stationary wire cages divided into horizontal compartments into which the stock is loosely thrown and the liquor circulated through this loosely packed material with propellers situated at one end of the machine. Still another type is the Klauder-Weldon machine consisting of a half-round kettle into which is circulated a perforated, hollow cylinder revolving on its axis in the kettle which in turn holds the dye liquor. This perforated cylinder is divided into four or more compartments which have swinging doors to admit the stock. The principle of this machine is the same as that of the open kettle, the stock being moved through the dye liquor. These machines can be had of rather large capacity.

While the machines save labor and increase production, they do not produce the evenness of shade and penetration that is obtainable in the open tub and are usually best adapted for the dyeing of the darker shades. The open tub therefore still holds its place of importance for the dyeing of wool as raw stock.

Warp Yarn Mercerizing

A Paper Presented at the Twenty-first Annual Meeting of the Alumni Association of the Philadelphia Textile School

By LAWRENCE A. STEAD

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WHEN John Mercer took out his patent in 1850, for "Improvements in the Preparation of Cotton and Other Fabric and Fibrous Materials" with strong caustic soda solution, he laid the foundation for the mercerizing industry, but very little or no importance was attached to Mercer's discovery at the time, and in fact it had no commercial application until thirty years later, when a patent was taken out for crinkled effects upon cloth, which had a very limited field.

The one phase of the process which made the mercerizing industry possible, i. e., the application of tension, was not discovered until 1890, when H. A. Lowe applied for a patent describing a method for the production of luster, which is essentially the same as the present-day method. During the following fifteen years, the industry was of slow growth, due to the lack of proper machinery to produce mercerized yarns in quantity. This can be attributed largely to the secrecy with which the manufacturers held their process. In the years following 1905 the industry made remarkable progress by the improvements in the warp mercerizing machines. These machines have been highly perfected, producing seven to eight tons of mercerized yarn a day. The operation is a continuous one instead of being conducted in several stages as formerly.

As the construction of machinery to the preparation of mercerized yarns has been highly developed, the process may be considered more mechanical than chemical.

Mercerizing under tension has become the only application of the process in practice, and the term "Mercerizing" is to-day known as the production of luster by the application of tension to the cotton while subjecting it to the action of strong caustic soda solutions.

As the knitting trade is the largest consumer of mercerized yarn, the processing of warps for this use is here described.

The warps containing 378 ends, known as quiller warps, and balled 6,000 yards in length, although at times they may be of greater or less length, depending on the size or count of yarn, are placed on a rack supported by a bar passing through the hole in the shell. The number of warps constituting a run on the machine depends almost entirely on the size of the yarn, the object being to control the load so that the same weight of yarn is passing through the machine. This tends to greater uniformity and permits of better control of chemicals. The warps after being set up are run in nearly as straight a line as is possible over brass rails, properly guided by pins to a binding machine.

The wraps now passing singly enter the binding machine at the bottom, passing beneath a wooden roller, which runs the full width of the binding apparatus. There are two such rollers running parallel to each other, the reason for which is to permit the warps to pass in a vertical manner through the tubes of the machine. The size of the machine will largely depend upon the local conditions, although it has been found when possible to have an increased number of tubes, and to reduce the number of warps passing through the individual tubes, which, of course, facilitates the subsequent splitting operation, e. g., it is far better, all things being equal, to run forty-eight warps through the binding machine having sixteen tubes, three warps to each tube, than it would be to run the same number of warps, six warps to a tube, through a binding machine having but eight tubes. The warps pass through these vertical brass tubes in sets, the number of which is determined by the size of the run. As the warps leave the tube they are bound by a cord in a spiral manner, the pitch of which is determined by the speed of the machine. It has been found that a pitch of 10 to 12 inches answers quite satisfactorily. The object of this spiral binding is to prevent any broken ends from falling away from the main body of the warps, which if allowed to do so, will cause serious damage to the yarn while passing through

the mercerizing machine, producing what in practice is known as roller laps. This condition is brought about by the free ends attaching themselves to the roller and accumulating as the warps pass through the machine. This becomes so aggravated at times as to cause the breaking of a number of warps and possibly tearing the roller away from its bearings.

The warps pass over rollers situated directly above the binding machine. Eight sets of warps pass over one roller, while the remaining eight pass over another. These rollers should be sufficiently high and located at such a distance apart from the entering end of the mercerizing machine, as to reduce the angle of the warps to a minimum. These machines are usually made up of 15-17 compartments, each compartment being a single unit in itself, but firmly fastened to each other. The object of these individual units is that they may be easily replaced at any time. The length of these units will vary according to the use for which they are designed.

The warps after leaving the binding apparatus pass into the boiling-out compartment, containing a solution of weak caustic soda and Turkey Red Oil, or an equivalent amount of a castor oil soap. The solution is brought to the boiling point and this temperature should be maintained as nearly as possible throughout the run. The cotton fiber in its natural state is water-repellent on account of the waxy matter it contains. It is obvious, therefore, that this preliminary boiling-out process be carried out, as it tends to remove extraneous matter, at the same time softening the waxy matters, thoroughly wetting out the yarn and making the cotton receptive for the caustic soda.

On the delivery end of this compartment and all subsequent compartments, are heavy rubber squeeze rolls, the object of which is to remove the excess liquor from the yarn previous to entering the succeeding compartments. The warps, after passing through the boiling-out liquor, should be delivered cold to the strong caustic liquor, otherwise the cotton becomes tendered through the formation of oxycellulose and the luster is somewhat impaired.

The third stage consists in the treatment of caustic soda of 50 deg. Tw., at a temperature not exceeding 60-70 deg. Fahr. In maintaining the proper strength of caustic soda in the mercerizing machines, it is essential to have a storage tank containing caustic liquor of about 70-80 deg. Tw., which flows by gravity to a large cistern, which is submerged in the floor. From here the liquor is pumped to the machines, and by means of overflows the liquor returns by gravity to the cistern to be again strengthened by the heavy liquor from the storage tank. Through this means of circulation the yarn to be mercerized is in constant contact with the liquor of the proper strength and temperature.

While the cotton is in contact with the caustic soda, chemical action effects a chemical transformation in the molecular structure of the fiber by the formation of a chemical compound between the cellulose and the alkaline hydrate in the molecular ratio $C_{12}H_{20}O_{10}$: 2NaOH. A second change is also observed by the fibers swelling similar to the process of ripening.

The general assumption has been that in order to produce luster, shrinking and swelling of the fibers are necessary. Hubner and Pope observed that the natural twist of the fiber does not always run in the same direction, but is generally twisted in parts to the right and in parts to the left, a number of these changes in the direction of the twist being perceptible throughout the length of a single fiber. Considerable importance is attached to this change of twist in the production of luster during mercerization.

It is a known fact that 40 deg. Tw. is the lowest concentration of caustic soda at which effective mercerization for practical purposes can be carried out, and if this be true, it necessarily follows that the production of luster is connected with the action of caustic soda of definite concentrations.

Investigation of the subject has confirmed this view that untwisting of the fiber precedes the swelling up to a caustic concentration of 40 deg. Tw., while the reverse is the case at concentrations above 40 deg. Tw. As there are certain chemicals which cause intense swelling, but no untwisting of the fiber and consequently no luster, it can be stated that in order to obtain maximum luster the mercerizing agent must produce in a high degree swelling, untwisting and shrinking of the fibers.

The yarn is in contact with the mercerizing caustic about two minutes. This is sufficiently long enough to insure mercerization, as can be seen from the following experimental data of Edmund Knecht, showing the influence of time on the mercerizing action of caustic soda of 50 deg. Td.:

Time	Shrinkage	Dyestuff Taken Up
5 seconds	15.7%	3.24%
10 seconds	17.4%	3.62%
20 seconds	25.0%	3.80%
40 seconds	25.0%	3.89%
60 seconds	25.0%	3.91%
180 seconds	27.4%	4.10%

Within the limits of actual working (say 40 to 180 seconds) there is not very much difference in the degree of mercerization, at all events, as far as the dyeing capacity is concerned.

The next step in the process is the removal of the caustic soda from the yarn, which is done in four washing compartments following the soda treatment. The washing is conducted on the counter-current principle. The wash water is heated to 120 deg. Fahr., and flows in an opposite direction to the travel of the yarn. By this method the yarn is constantly coming in contact with water containing less amount of caustic soda. The wash water is controlled so that an 8 deg. Tw. caustic is constantly

(*Continued on page* 455.)

Pongee Silk Troubles

Cleaning of Pongee Dresses—Bleaching of Pongees—Dyeing of Pongees—Recommended Colors

By JOSEPH LOEBL

THERE is hardly any article among the textile fabrics which causes more headache to the cleaners and dyers than dresses made of Pongee or Tussah silk, and whatever operation has to be done, whether bleaching, cleaning or dyeing, is sure to be met with difficulty. I hope it will be of great interest to you to hear a little bit about this wild silk.

Cleaning of Pongee Dresses

The dry cleaning process does not give a very satisfactory result on this article. It is best not to use a hard brush, as the brush injures the fabric easily, but the best thing is to run it in the washer with a good benzine soap and after rinsing and drying to wash the goods with soap bark, or tetropole solution, and to rinse it finally with acetic acid. Where no wet-cleaning is available, the spotter has to show his skill. Brushing with a spotting brush will be sure to leave spotting marks. Therefore it is a rule not to use the brush, the best being mostly the sponge.

It is to a great advantage, however, while spotting pongees, to ascertain in the first place what has caused the stain, and sometimes just steaming will remove certain stains such as water marks, etc. Little dark and black points often found on pongees are removed with diluted muriatic acid. Coffee, cocoa, sugar stains, etc., will yield to glycerine. The stains are tapped with glycerine and left for a while, so that the glycerine will soften the stains. The next operation is to rinse carefully with cold or lukewarm distilled water and sponge. If the stains are not completely removed, repeat the operation, or if you are a skilled spotter, use hydrogen peroxide or perborate solution very carefully. It is very hard to remove ink stains without leaving a mark. Use Solvent P-2 with a little ammonia.

Patience is necessary in removing stains from pongees. The spotting should not be forced on this material as on other goods, but the stain must be given plenty of time to soften and to dissolve. The use of permanganate and sulphurous acid is not advisable, as the permanganate will surely leave a bad spotting mark. Of course, it may often happen to the most skillful spotter that he cannot avoid a spotting mark, but it is his business to hide such marks again as much as he can. A good remedy for spotting marks on raw silk as undyed pongees, is to put a little sweet oil on a flannel rag, and to spread over with this rag, all the marks. Such marks on dyed pongees are best covered with the so-called dry dyes, but it would take me quite a while, as well as a lot of space, to describe this operation in detail, so I will do that at some other opportunity.

Bleaching of Pongees

The cleaner will seldom find it necessary to bleach pongees, and a treatment with permanganate of potash and sulphurous acid after the wet-cleaning of white pongee will mostly give satisfactory results. A little bluing is the best rinse and with Methyl Violet or Formyl Blue will mostly accomplish the whiteness. But in case the dyer has to dye some delicate shade on pongee, it is quite necessary to have bleached material, or rather perfectly bleached material. The best results are obtained with the hydrogen peroxide bleach.

For this purpose the bleaching bath must be heated to at least 180 deg., or best to the boil. Then add five pounds hydrogen peroxide (10 or 12 volume) to each ten pounds of Tussah silk. The bleaching bath must be made alkaline, which is best done by adding one pound silicate of soda to each ten pounds of hydrogen peroxide. The goods are then left in this bleaching bath for several hours.

For all dyeing purposes, or when working with goods that have to be dyed, this bleach will not be sufficient, but the goods have to remain white (that is, will not be dyed after this operation). It is necessary to add a little bluing. The highest grade of pure whiteness of this article is obtained by treating the material of a blue dyestuff such as bluish tint. The bluish pongees are now bleached with hydrogen peroxide. This operation of treating the material with this solution of a blue dyestuff will not only leave the goods beautifully white after the process, but will save a great amount of hydrogen peroxide.

Dyeing of Pongees

The dyeing of pongees in colors is contrary to the black color; that is, it is not hard at all. The best results are always obtained by dyeing in two baths. That means to bottom with direct colors, and to top with acid colors, with the addition of formic acid.

For instance, for navy blue, bottom with Union Blue 1-2472, dye for about three-quarters of an hour, rinse, and top with Cyanole Extra, or Formyl Violet, or with Brilliant Milling Blue, and Formyl Blue. An addition of a little Puropol is always recommended.

Brown pongee, or rather brown on pongees, can be dyed very well with substantive colors; for instance, Union Brown A, shaded with Diamine Yellow M.

For green, Diamine Green C L, shaded with the above-

mentioned yellow, is suitable. For very bright shades, top under addition of formic acid. Acid with Acid Green Extra, eventually shaded with Acid Yellow A T, topping with acid colors is also very good; for example, Brilliant Green shaded with Thiaflavin T, but such baths should not be too strong, as this dyeing is mostly cracking, and careful rinsing is particularly necessary to the topping bath.

To obtain nice red shades, a bottoming with sale colors is absolutely necessary, or to an advantage. Diamine Scarlet 3B shaded with Diamine N. The tapping is in the formic acid bath with Brilliant Croceine 5B for light shades, with Bordeaux BL, Amaranth B or Rocelin for medium shades, and the same colors shaded with Formyl-Violet or Cyanine for darker reds.

All dyeings with substantive colors can be topped with basic colors, but there is first the danger of cracking and unevenness. The topping with acid colors in a formic acid bath gives the purest and clearest and most beautiful shades. Dyed with substantive colors, they have furthermore the property to take the acid colors without the addition of much acid. Only a small amount of ammonia will be necessary.

If the finishing is done damp, pongees should not be sized. To avoid stripes, which sometimes occur when pongees are pressed damp or wet, is the reason they should not be sized.—"Cleaners and Dyers Review."

Chemical Fire Hazards

Protection for the Chemical Industry from the Standpoint of a Fire Insurance Underwriter

By William G. Grier

General Agent, North British and Mercantile Insurance Company, Ltd.

Assumption of liability upon risks or properties involving the hazard of chemical operations used to be dreaded by fire insurance companies the world over, and the rule was to dodge religiously plants where the chemical hazard was developed to any extent, even at very high rates. This almost universal feeling that such plants were not profitable subjects upon which to risk company stockholders' money may be ascribed to several causes; first, the fear born of ignorance and that there was a hazard present more or less of an unknown quantity, the strange and mysterious names and terms used, the very great difficulty of obtaining any other than the most vague information as to the nature of the processes involved, and so on, were largely responsible for this attitude. Owing to the fact that the number of chemical risks in the United States was comparatively small and the hazards unusually severe, the chances of securing a sufficient volume of business of this character, even at the high rates, were so small that it became an underwriting policy to avoid them almost entirely. In a few cases very small amounts were written, principally of the so-called "accommodation business," to assist valued agents in caring for their clientele.

This state of affairs has happily changed for the better, until to-day there are many plants devoted exclusively to the manufacture of a large variety of chemical products, of excellent construction, with good public or private fire protection well divided up among numerous separate or cut-off buildings or sections, that constitute very acceptable risks. In order to obtain the most advantageous insurance conditions there are certain cardinal points that are to be observed. Buildings should be low, preferably one story; walls, brick or hollow tile, of moderate area and well separate so as not to seriously expose each other. The roofs should be of light construction, especially where there are explosion possibilities, and floors of concrete. Particular care should be taken that the hazardous portions of the plant do not expose the power house and steam plant, the destruction of which would cripple the entire operation of the works.

In this connection one of the most important precautions to be observed is to see to it that ample space is provided for the packing and storage of valuable raw materials and finished products where they will not be endangered by a fire in the more hazardous part of the plant. Neglect of this precaution has caused some of the most serious losses in the writer's experience. Ample external and internal fire protection should be provided by installation of public or private hydrants, with hose equipment; and if the water supply from public mains is insufficient, supply should be furnished by means of pumps of approved type.

Outside of the common hazards of all manufacturing plants, such as lighting, heating, general cleanliness and upkeep, those most feared may be described as follows, commencing with the manufacturing processes. I will refer only to those that seem to stand out more prominently as constituting frequent causes of fire:

Drying, of either raw material or finished product, is frequently carried on in wooden closets heated by steam. This is always dangerous, even with low-pressure steam. Dry closets or boxes should always be constructed of non-combustible materials with metal trays where this sort of drying is carried on. As a matter of fact, when there are so many excellent forms of drying apparatus of high efficiency on the market, it has always been a matter of surprise to the writer that the primitive wooden dry closets is still so much in evidence, even when materials known to be subject to spontaneous ignition or products that have been washed or extracted with organic solvents of a highly combustible nature are handled. The types of fans or exhausts used in such places are sometimes a cause of fire or explosion where there are inflammable fumes or dust present.

(*Continued on page* 467.)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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Lowell Textile School, Lowell, Mass.

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WALTER M. SCOTT

FORMATION OF PHILADELPHIA LOCAL SECTION

At the Council Meeting of the American Association of Textile Chemists and Colorists held in Boston on June 9, 1922, a petition was presented requesting permission to form a Local Section of the Association with headquarters in Philadelphia, to be known as the Philadelphia Local Section.

The petition, which read as follows, was duly signed by twenty-six Active Members of the Association:

TO THE COUNCIL OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS:

Gentlemen—The following members of the American Association of Textile Chemists and Colorists, desiring to organize a Local Section of the Association at Philadelphia, do hereby request your official approval as required by the Constitution of the Association:

Sidney S. Bailey, Jr.
Elmer C. Bertolet
R. A. Carter
W. G. Hamlen, Jr.
Charles S. Hollander
L. N. Hood
Russell W. Hunt
Albert S. Jones
W. R. MacIntyre
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J. Henry Shackelton
Lawrence A. Stead
Percival Theel
Joseph L. Wade
L. DeCosta Ward
Howard R. Watt
M. H. Wertheim
Clarence C. W. Wilson

It was a great pleasure to the Council to approve the foregoing petition, and in accordance with Article XIII of the Constitution it proceeded with the election of a Secretary Pro-Tem, Prof. E. C. Bertolet of the Philadelphia Textile School being chosen in this capacity.

While this new section is to be known as the Philadelphia Local Section, the geograaphical boundaries of same will embrace the entire State of Pennsylvania, southern New Jersey, including that portion of the State south of a line just north of the city of Trenton and extending to the Atlantic Ocean in an easterly direction; the entire States of Delaware and Maryland.

There was some discussion as to the advisability of including Virginia and West Virginia, but the Council considered it better to adhere to the boundaries outlined above. It should be clearly understood, however, that members residing in the States of Virginia and West Virginia, as well as any other States in that locality, are eligible and are urged to affiliate themselves with the Philadelphia Local Section.

The Council is particularly pleased with the desire of the members in the vicinity of Philadelphia for the formation of this Local Section, and same should logically be one of the most active and progressive of the entire Association owing to its location in one of America's large textile centers and the great number of potential members in that vicinity.

SEVENTH RESEARCH COMMITTEE MEETING

The seventh meeting of the Research Committee of the American Association of Textile Chemists and Colorists was held in the Engineers' Club, Boston, Mass., Friday afternoon, June 9, 1922.

The following members were in attendance:

L. A. Olney
William K. Robbins
William D. Livemore
William H. Cady
George A. Moran
A. E. Hirst
W. M. Scott
Winthrop C. Durfee
William R. Moorhouse
W. J. Murray
W. E. Hadley

The complete outline of the paper prepared on "Fastness to Washing, Soaping, Laundering, and Fulling of Dyed and Printed Cotton Against White Cotton" was thoroughly discussed by the Research Committee. The foregoing paper had been prepared under direction of George A. Moran, Chairman of the Special Committee appointed to consider the subject.

A number of slight changes were made in the character of the paper, and it was then considered to be complete enough to warrant its publication as a provisional method. Following the publication of this paper it is earnestly hoped by the members of the Research Committee that any criticisms that will be made and any additions or alterations needed to improve its character will be brought to the attention of the Research Committee.

It should be noted that Dr. A. F. Shupp, of the Mellon Institute, has been elected a member of the Special Committee investigating the "Fastness to Washing, Soaping, Laundering, and the Fulling of Dyed and Printed Cotton Against White Cotton." The work of Dr. Shupp at the Mellon Institute and his association with the work of the Laundryowners' National Association render his appointment particularly valuable to the Research Committee, and to the Association at large.

A special committee was appointed by the President to work throughout the summer considering the Fastness of Dyed and Printed Cotton, Wool and Silk to the Action of Light. The committee consists of the following members:

William H. Cady, Chairman
George A. Moran
William K. Robbins
R. E. Rose
W. M. Scott
W. J. Murray
Hugh Christison

A special committee was appointed to work throughout the summer considering the Fastness of Dyed and Printed Materials to the Action of Bleaching. The committee consists of:

A. E. Hirst, Chairman
O. R. Flynn
W. E. Hadley

Both of the above committees are to report at the first Research Committee meeting held in September.

Respectfully submitted,

WALTER E. HADLEY, Secretary.

CHANGES OF ADDRESS

The following changes and correction in names and addresses of members should be noted:

Fred L. Nuttall, 2504 West Silver Street, Philadelphia, Pa.

Joseph W. Russell, Palmer Mill, Three Rivers, Mass.

Edwin S. Millspaugh, care of Atlantic Dyestuff Company, Real Estate Trust Building, Philadelphia, Pa.

NOTICE FROM THE SECRETARY

Applications for Membership in the American Association of Textile Chemists and Colorists

All individuals who believe that they are eligible for membership in the Association and are desirous of affiliating with the organization can communicate with the Secretary, who will gladly furnish application blanks and extend to them every possible assistance.

It is desirable that members of the Association should make an effort to interest all those who they believe would make desirable members.

The Secretary will at all times be pleased to provide members with as many application blanks as may be desired.

WALTER E. HADLEY, Secretary.
5 Mountain Avenue, Maplewood, N. J.

Proceedings of the American Association of Textile Chemists and Colorists

Provisional Method on Fastness to Washing, Soaping, Laundering and Fulling of Dyed and Printed Cotton Against White Cotton

THE following provisional method on "Fastness to Washing, Soaping, Laundering and Fulling of Dyed and Printed Cotton Against White Cotton" is published by George A. Moran, Chairman of the Sub-Committee of the Research Committee which was appointed for this purpose.

In submitting this report the Research Committee wishes it definitely understood that it is provisional and is open for suggestions or discussions on the part of the members of the Association, or any others who may be especially interested.

This method will not be adopted as an official method until sufficient time has elapsed to give everyone an opportunity to make any criticisms or suggestions that may be necessary for its improvement, and with this in mind the Research Committee specially invites such comment.

The subject of the fastness to fulling is not included in this report, as it is being separately considered. It will be reported upon later.

A—Fastness to Boiling Soap and Soda.
B—Fastness to Laundering.
C—Fastness to Mild Washing and Soaping.
D—Fastness to Fulling.

A

FASTNESS TO BOILING SOAP AND SODA

This test subjects the colors to the severest treatment to which they should be subjected in a home washing.

This test is carried out as follows:

Test A—The material braided with an equal weight of white cotton, or sewed onto a piece of white cotton cloth, is treated at the boil for ten minutes in a solution of 5/10 per cent soap and 2/10 per cent soda ash (58 per cent), stirring gently with a glass rod. The soap is to be a good grade of 88 per cent neutral chip tallow soap and the volume of liquor fifty times the weight of the goods. After ten minutes, lift, rinse twice in water at 105 deg. Fahr. for one minute each time, pass through squeeze rolls after each rinse, and dry by hanging in drying closet. Repeat this treatment three times.

Classification	*Type*
1. When treated as in Test A the shade remains unaltered and white cotton remains untinted.	1. Alizarine Red—old method) or Naphthol AS developed with Fast Red G Base or Indanthrene Blue GCD Dbl. Paste (842) 6 per cent dyeing, or Indanthrene Violet RR Ex. Paste (767) 16-ounce printed shade.
2. When treated as in A the shade is moderately altered, but the white is untinged.	2. Ciba Scarlet G (907).

Classification	*Type*
3. When treated as in Test A the shade is slightly altered and the white cotton is more or less tinted.	3. Sulphur Indone 2R Conc. (733) 12 per cent dyeing with twice the amount of Sodium Sulphide crystals —rinsed thoroughly in warm water but not after-treated—or Paranitraniline Red dyeing or print; full shade.
4. When treated as in Test A the shade is moderately altered and white cotton is badly stained.	4. Pyrogene Green 3G (709) 12 per cent dyeing—Primuline (616) 5 per cent dyeing.
5. When treated as in Test A the shade is considerably reduced but not destroyed. The cotton is not tinted.	5. Alizarine Blue S Pdr. (804) 4-ounce printed shade fixed with Acetate of Chrome, or Indigo Blue (874)—medium navy shade dyed in four dips in the hydrosulphite vat and thoroughly rinsed—or Pigment Ultramarine Blue or Lampblack printed shade fixed with Blood Albumen, 1 pound to the gallon of printing color, and steamed one hour. Shade to be a full deep shade.
6. When treated as in Test A the color is very nearly destroyed and the white cotton is more or less tinged.	6. Indoin Blue BB (126)—2½ per cent dyeing on a 6 per cent Tannin Mordant fixed with Antimony Salts—or a 4-ounce printed shade or Methylene Blue B (659) dyed or printed shade as above.

Colors which come under classification No. 1 should be satisfactory for any home washing treatment. Those coming under classification No. 2, while not equal to No. 1, should be reasonably satisfactory. The other four classifications will prove more or less unsatisfactory when subjected to the severest requirements, but may be satisfactory when subjected to less severe treatment.

B

FASTNESS TO LAUNDERING

This test applies to colors that are to be washed by power laundries and which should stand the treatment for washing cotton fabrics as prescribed by the Laundry Owners' National Association.

This test is carried out as follows:

Test B—The material braided with an equal weight of white cotton or sewed onto a piece of white cotton cloth is treated in a solution containing 1/10 per cent soap and 1/10 per cent soda ash, at a temperature of 160 deg. Fahr. The soap is to be a good grade of 88 per cent neutral chip tallow soap and the volume of liquor fifty times the weight of the goods. Stir vigorously with a glass rod for ten minutes, rinse in water at 160 deg. Fahr. and dry; repeat this test three times. Then treat for ten minutes at 150 deg. Fahr. in a soda chemic solution containing 1/100 per cent available chlorine, rinse and treat for ten minutes at 105 deg. Fahr. in a solution containing 1/20 per cent oxalic acid. Rinse and dry.

Classification	*Type*
1. When treated as in Test B the shade is unaffected and white cotton is untinged.	1. Alizarine Red—old method. Indanthrene Yellow G Paste (849) 6 per cent dyeing—Indanthrene Violet RR Ex. Paste (767) 16-ounce printing color. Naphthol AS developed with Fast Red G Base.

Classification	*Type*
2. When treated as in Test B the shade is somewhat reduced but white cotton is untinged.	2. Brilliant Indigo B (885) 5 per cent dyeing or 4 ounces to gallon printed shade.
3. When treated as in Test B the shade is considerably affected.	3. Alizarine Blue S (804) printed shades. Sulphur Black (720).
4. When treated as in Test B the shade is badly affected.	4. Methylene Blue B (659) dyed or printed shade.

Colors which come under classification No. 1, Test B, possess satisfactory fastness to laundry treatment. Those that come under classification No. 2, while inferior to No. 1, should stand laundry treatment satisfactorily unless subjected to extra severe treatment. Those coming under classification No. 3 and classification No. 4 will not stand laundry treatment in a satisfactory manner.

C

FASTNESS TO MILD WASHING AND SOAPING

This test applies to colors that do not stand Test A or B but do possess moderate fastness to washing if treated carefully and at a low temperature.

The test is carried out as follows:

Test C—The material braided with an equal weight of white cotton, or sewed onto a piece of white cotton cloth, is subjected to the action of a 2/10 per cent soap solution at a temperature of 120 deg. Fahr. for three periods of five minutes each, squeezing after each treatment so as to leave 100 per cent of its weight of liquor in the goods. The soap is to be a good grade of 88 per cent neutral chip tallow soap and the volume of liquor fifty times the weight of the goods. The goods are then lifted, rinsed twice in water at 105 deg. Fahr. for one minute each time, squeezing after each rinse, and dried by hanging in a drying closet.

Classification	*Type*
1. When treated as in Test C the dyeing is unchanged and cotton is not stained, or, but, slightly tinted.	1. Five per cent Primuline (616) dyeing diazotized and developed with Beta-naphthol, New Methylene Blue N (663).
2. When treated as in Test C the dyeing is only slightly changed, bleeds but little, and the cotton is only stained to a moderate extent.	2. Diamine Sky Blue (426) or Benzo Fast Blue 4GL or Diamine Fast Blue FFB, or Diamine Fast Orange EG—3 per cent dyeings at the boil for one and one-quarter hours with Glauber salt.
3. When treated as in Test C the color bleeds badly and stains the white to a considerable extent.	3. Chrysopheneine G (304) or Benzo Fast Red 8BL —3 per cent dyeings. Dyed at the boil for one and one-quarter hours with Glauber salt.

Classification	*Type*
4. When treated as in Test C the color is almost completely washed out and white cotton is more or less tinged.	4. Croceine Scarlet 3B (249) or Soluble Blue (539).

Colors which come under classification No. 1, Test C, should stand ordinary home washing if carried out at low temperature with a good grade of soap. Classification No. 2 will stand, in medium and light shades, a home washing if carried out with care and at low temperatures and a good grade of soap. Classification No. 3 will not stand washing satisfactorily. Classification No. 4 will not stand any washing.

Results that are intermediate between the above-selected types may be indicated by plus or minus the type to which they are nearest in fastness. Pre-war names have been used for the type dyestuffs as being more definite and better known. Most of these dyestuffs are produced domestically and offered by various manufacturers under well-known trade names, and can equally well be used as types.

Communication from the President

There have now appeared in the Proceedings provisional methods for the testing of dyed cotton, wool and silk material as regards fastness towards washing, scouring and in the case of wool and silk, fulling. The method for fastness of dyed cotton in material which is fulled, is yet to be reported.

It is desirable that every member fully understand that these methods are provisional, and that they will not be accepted by the Council as official methods, until sufficient opportunity has been given for every member as well as other interested persons to express his opinion as to how they might be modified, revised or extended in order that they may best answer their desired purpose.

While we have as yet received no direct comment in regard to these proposed methods, we have indirectly heard that there are those who believe that they might be modified or improved in certain ways. As far as can be learned the Council and Research Committee have officially received no such comments or recommendations, neither have they been able to ascertain just the nature of the suggested improvements.

The object of this communication is to again impress upon every member of the American Association of Textile Chemists and Colorists the fact that the Council and Research Committee are simply your representatives in this matter and, after several months' deliberation, they have presented for your consideration what they, in the light of all information at hand, believed to be the most satisfactory methods.

It is far better that all criticisms should be made immediately, so that the Research Committee will have sufficient opportunity to consider them and, if thought best, incorporate them into the final methods which will eventually be submitted for adoption.

It is therefore earnestly requested that each member will carefully study these provisional methods as they appear and immediately report to the various chairmen of the sub-committees their views in regard to them.

For your convenience it may be stated that the provisional method on "Fastness of Dyed Silk to Washing, Scouring and Fulling" appears on page 70 of the Proceedings in the May 22 number of the AMERICAN DYESTUFF REPORTER; the method on "Fastness of Dyed Wool to Scouring, Washing and Fulling" on page 54 of the Proceedings in the issue of May 8, and the provisional method for "Fastness of Dyed Cotton to Washing and Scouring" in the Proceedings of the present number.

William D. Livemore is Chairman of the sub-committee on "Fastness of Dyed Wool to Scouring, Fulling and Washing." Walter M. Scott is Chairman of the sub-committee on "Fastness of Dyed Silk to Washing, Scouring and Fulling," and George A. Moran is Chairman of the sub-committee on "Fastness of Dyed Cotton to Washing and Scouring." Communications

in regard to these may be addressed to them directly or to the President or Secretary of the Association.

It is extremely desirable that the Proceedings of the Association should occupy four pages or a multiple of four pages in each issue. In this way it is possible for every member if he so wishes to remove the Proceedings of the Association and have them bound separately. It is a very difficult matter, however, to have the material for publication come out just right. Oftentimes, it is necessary to withhold some material which we would like to publish very much, but owing to the fact that we cannot fill another four pages its publication has to be postponed. The only way to obviate this difficulty would be to have on hand at all times sufficient material to fill in the whole four pages. This could be done if the individual members would furnish us with short communications in regard to various matters of interest to the Association as a whole, also any items of news either personal or otherwise which they believe would be of interest.

It is earnestly requested that the members of the Association seriously consider this matter and if possible assist the editors by furnishing them with a certain amount of material of this type. We should also be pleased to receive any suggestions in regard to the nature of the material which has been or which might be published in the Proceedings.

L. A. Olney, President.

ELECTROMETRIC TITRATION AS A MEANS OF DETERMINING THE FREE SODIUM SULPHIDE IN A SULPHUR BLACK DYE BATH

By W. Walker Russell and Samuel T. Arnold

(*Concluded from page 71.*)

The pipette first filled is drawn down to the mark and the tip is at once immersed in its respective iodine solution. The same procedure is carried out with the second pipette. The tip of the first pipette is kept well under the surface of the iodine solution, as the dye bath sample is released and the whole well stirred. The pipette is rinsed into the solution and 25 cc. of N/10 sodium thiosulphate[8] are added, after the iodine has been allowed to react for one minute. This same procedure is immediately carried out with the second pipette. The samples are now ready for back titration with iodine, the dyestuff being present as a suspended precipitate which soon settles and leaves a clear solution.[9]

The beaker containing one of the samples is placed in the electrometric apparatus with the two electrodes dipping into the solution as previously described. Iodine is added as rapidly as is feasible, taking the largest permanent deflection of the galvanometer needle as the end point. In case of running by the end point a few drops of thiosulphate are added, and an end point located by adding iodine drop by drop. The deflection of the galvanometer is much more pronounced when adding the oxidizing solution.

The scale of equal parts on the apparatus is very useful in locating end points in case the amount of the reagent that will be required is not very closely known. It has been the experience of the writer that the end point is always indicated by the largest movement of the slider (the amount of resistance it is necessary to put into balance the galvanometer for the addition of a given amount of reagent) and that this maximum movement always takes place over the same portion of the scale for determinations carried out in like manner. Therefore, in this determination, iodine may be added rapidly until the position of the slider indicates the close approach of the end point. Since the large permanent deflection indicating the end point is very sharp for the addition of one drop of N/10 iodine, the use of the scale is arbitrary. The sharpness of the deflections depends somewhat upon the condition of the platinum electrode. The solution now contains a precipitate and some sulphur may be in suspension. Therefore, it has been found good practice to ignite this electrode to redness between titrations, thereby destroying any film which rinsing might not remove.

By using this method, it has been possible to obtain checks in duplicate determinations accurate to within less than 0.5 per cent of the actual amount of free sodium sulphide present. Here, as in the distillation method of Swann already referred to, it is shown that the total sulphide content is not indicated by the titrations, but rather that portion of the sulphide which has not combined with, or reduced the dyestuff.

A typical titration is given to show this.

Two baths were prepared containing the same amounts of sodium sulphide. The first contained no dye, while the second contained one gram of sulphur dyestuff:

	Amount of Dyestuff	$Na_2S.9H_2O$ Indicated
1	0 gm.	3.2157 gm.
2	1 gm.	2.9887 gm.
Difference		0.2270 gm.

Several titrations are included which were carried out according to the preceding method:

Nos.	Sample	CC. of 0.9833 N/10 Iodine Required	Per Cent of $Na_2S.9H_2O$ Present
1 (a)	50.37 cc.	57.53	1.357
(b)	50.24 cc.	57.43	1.359
		1.0116 N/10 CC. of Iodine[10] Required	
2 (a)	50.37 cc.	55.65	1.342
(b)	50.24 cc.	55.75	1.348
3 (a)	50.37 cc.	49.43	1.192
(b)	50.24 cc.	49.09	1.187

A method is offered whereby the amount of free sodium sulphide in a standing sulphur black dye bath may be determined. The determination is accurate to within less than 0.5 per cent of the free sodium sulphide actually present. In practice, it is suggested that a single titration carefully carried out will give sufficiently accurate information as to the sulphide content of a sulphur dye bath, since this content is always changing.

[8] Thiosulphate in excess of the amount necessary to react with the free iodine present is added.

[9] At this point, if it is not desired to use the electrometric method, which is both quick and accurate, the contents of the beaker may be rinsed into a liter flask and made up to the mark. Samples may be removed by means of a pipette after the precipitate settles, or the solution may be filtered and a sample taken from the filtrate. By either way we obtain a perfectly clear liquid which may be back titrated with iodine, using starch as an indicator

[10] The iodine solution used in this work was standardized against carefully prepared barium thiosulphate by means of the electrometric apparatus

Note—The last two sets of titrations (2 and 3) were made on the same bath, but carried out one week apart, the bath in the meantime having been kept in a tightly stoppered flask.

EIGHTH COUNCIL MEETING

The eighth Council meeting of the American Association of Textile Chemists and Colorists was held at the Engineers' Club, Boston, Mass., on Friday, June 9, 1922.

The following members were in attendance:

L. A. Olney
William D. Livermore
William H. Cady
George A. Moran
A. E. Hirst
W. M. Scott
Winthrop C. Durfee
W. E. Hadley
William K. Robbins

By vote of the Council, it was decided to hold no further meetings of the Council until September, the date of said meeting to be decided upon by the President.

The Secretary presented the names of thirteen applicants for Active Membership and six applicants for Junior Membership, and these names were carefully considered by the Council. In some instances more information was desired as to the qualifications of certain of the applicants, and the Secretary was instructed to obtain same. The Secretary was instructed to immediately send out the list of names in accordance with Article IV of the Constitution, and at the expiration of thirty days, if no objections are filed, those applicants who were considered satisfactory by the Council will be elected to membership. Membership applications received from now on will be presented at the first meeting held in September.

A petition for the formation of a Local Section of the Association was received from Prof. E. C. Bertolet, of the Philadelphia Textile School, together with letters from twenty-six members residing in that locality. The Council approved the formation of this Local Section, and appointed Prof. Bertolet Chairman Pro-Tem, with authority to proceed with the formation of such section.

By vote of the Council the boundaries of the Philadelphia Section shall be as follows:

The entire State of Pennsylvania, New Jersey south of a line including the city of Trenton and extending eastward to Atlantic Ocean, and the entire States of Maryland and Delaware.

Respectfully submitted,

WALTER E. HADLEY, Secretary.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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A BRITISH WARNING

TWO recent events in the dyestuff field in England are full of significance for the dyestuff industry in this country.

The first is the resignation from the directorate of British Dyes, Ltd., of Dr. Herbert Levinstein on the frankly stated ground that the direction and control of this organization is not in expert and technical hands, and that the dyestuff industry can never be established successfully in England until this is done. Dr. Levinstein cites the well-known organizations in Switzerland and Germany, with their expert direction and management, as instances of the way in which the industry should be conducted.

The second incident is the address delivered at the annual meeting of the British Cotton and Wool Dyers Association by the Chairman, A. N. Hoegger. In this address he uses the following language:

"As large shareholders in the British Dyestuffs Corporation, and with all due respect for the high business qualities of the members of the Board of Directors, may I most respectfully suggest that the sooner a manager possessed of the best possible chemical knowledge, technical training and great experience in the dye-making industry is put at the head of affairs, the better it will be, not only for the color-using community of the country but also for the shareholders of the British Dyestuffs Corporation. [Hear, Hear!] The success of the German and Swiss color works is due entirely to having men at the head of affairs who are unexcelled in technical training and experience. The highest talent is required, and the greatest possible efforts must be made in perfecting our dye-making industry, if we wish to retain our former supremacy in the textile trades of the world." [Applause.]

It is interesting to observe how exactly parallel have been the conditions and surroundings of the dyestuff industry in this country to those in England. The same motivating impulse to create a dyestuff industry was felt in both these industrial countries; the same efforts to establish it were made in both countries. Although in England it received the active support of the Government, the same obstacles had to be overcome and the same opposition on the part of the textile trades had to be met. The same lack of cohesion and unity of effort among the dyestuff manufacturers themselves was experienced and the same efforts to throttle the nascent industry on the part of the Interessen-Gemeinschaft had to be confronted. And now comes to the front a plainly stated possibility of danger to the British industry which is equally a menace to it in this country. It must be evident to anyone giving any thought to the situation that the gentlemen who are in active control of the American dyestuff industry are not usually men who are familiar with or have had any technical training and experience in the chemical field. They are not familiar with the precedents and traditions of the industry nor do they have the necessary familiarity with the trades served, or with their requirements and technique. In practically all of the large and leading companies is this the case, and the executive managers have, almost without exception, come from the ranks of other activities.

They are bankers, lawyers, merchants—but are not dyestuff manufacturers. Their abilities in these other paths of endeavor are marked, but they do not have the vision that is necessary to put the American dyestuff industry where it should be and to keep it safe from assault and injury. It is because of their unfamiliarity with these aspects of the business that the counsels of timidity, of vacillation and of unwise secrecy have prevailed throughout the three years of effort to secure recognition of the vital nature of the industry from Congress. And it is due to this unfamiliarity as much as to anything else that the industry has steadily lost ground in public estimation and occupies to-day a worse position than it did in 1919 when the Longworth Bill was introduced.

Is it not time for the American dyestuff industry to question itself as seriously as the British industry is now doing, as to whether it is not necessary for its future and continued success that the active and executive heads of the various companies should be trained, expert, and experienced dyestuff manufacturers?

We believe that most of those connected with the American industry, and particularly those who fully understand the very real gulf which lies between the possession of a thorough technical training and the lack of this essential background for efficient leadership, will be disposed to agree that it is. The theory that intelligence combined with inherent executive ability and a sound business and financial training, can, with the aid of expert technical counsel, successfully direct an enterprise in almost any field, does not appear to work out happily in the case of the dyestuff industry. Moreover, it is becoming more and more apparent that even when fortified by several years' actual administration of a dye manufacturing organization, these undeniably excellent qualities

remain insufficient. It would seem that no amount of native cleverness and adaptability can ever make up for the lack of such training as the heads of Swiss and German dyestuff companies have received, and in view of the fact that applied coal-tar chemistry is probably the most involved, tricky and complex manufacturing endeavor of mankind, this is not to be wondered at.

Nothing herein stated is set forth as the slightest disparagement of the soundness and ability of the present heads of American dye companies. It has merely become evident in a number of ways that the industry is on the wrong track in trying to make dyestuff technicians of its executives.

Would it not be better, therefore, to face about and attempt the more logical procedure of making executives of the technically trained dye men?

COMPETITION FROM REPARATION COLORS

IN its discussion on June 5 of the situation arising from the sale to German interests of the control of the Bianchi dye manufacturing firm in Italy, The REPORTER cited the competition which Italian dye makers had received from Italy's allotment of Reparation colors, which, supplementing the further competition of licensed German imports, proved to be greater odds than the ill-equipped Italian industry could withstand. As a corollary of this, the situation in America was covered by the statement: "With the help of the artificially maintained war embargo, the American dye manufacturers have held even with the game, in spite of competition from America's Reparation color allotment."

It was this statement which chanced to draw the fire of several elements of the American dye trade, engaged more particularly in the sale and distribution of dyestuffs as opposed to the strictly manufacturing forces. Both telephonically and verbally The REPORTER was called to task for venturing upon any kind of an assertion to the effect that Reparation colors were in any way, shape or form competitors of American-made dyes. It was explained at some length by those interested that the greatest care, the most precise supervision, had been exercised with a view to preventing so undesirable an occurrence. It was further put forward that, so far from offering competition to American-made dyes, the Reparation colors supplemented the output of American manufacturers, and in many cases even served to stimulate the demand for the latter.

It was explained that the supplementary character of the Reparation colors was achieved in two ways: Colors not made here at all were imported in quantities necessary to supply the demand in accordance with the procedure determined upon shortly after the signing of the Armistice, and colors made here in quantities insufficient to supply 100 per cent of the demand were imported in quantities to make up the difference.

Further than this, it was strongly brought out that by the judicious importation of specialties designed to be used in conjunction with various American-made dyestuffs, the sale of these was aided considerably.

Beyond a doubt the greatest care has been exercised to make this ideal a reality. Beyond a doubt the foregoing statements are entirely true—theoretically. But makers of American dyestuffs maintain, for their part, that they are not always wholly true in actual practice. Speaking for itself, The REPORTER is ready to concede that perhaps certain readers may have assumed, from its editorial statement, the competition from Reparation colors to be more severe than is really the case, or than The REPORTER intended to convey—for we believe the great majority to be well enough informed on this subject not to have taken it as an exaggeration of the facts, nor even to have given it a second thought. American dye manufacturers, too, agree that competition from Reparation colors is not necessarily severe enough to constitute, in itself, a grave menace. Nevertheless, they maintain that competition does exist and always must exist owing to technical limitations in the administration of our dye import control regulations.

As an example of this, the single instance of Cyanone Blue may be referred to. This product is made by several American manufacturers under the name given above; it is also made by Cassella, of the I. G., and sold by the latter under this name. Badische, however, makes and sells it under an entirely different name, with the result that importation of the Cassella product was refused on the ground that it was a competing color, whereas the Powers That Be, not knowing that the two were identical, and having no facilities for an analytical determination of this fact, freely admitted the Badische product.

This is but one instance. Others might be cited, but will probably suggest themselves to the reader. The conclusion, however, is that with the best intentions in the world our authorities are physically—or shall we say chemically?—incapable of preventing competition between Reparation colors and American-made colors in all instances.

THE INDEX

With this issue, The AMERICAN DYESTUFF REPORTER prints an index of the subjects and authors included under Volume X. Technical articles appearing in the Proceedings of the A. A. T. C. C. are listed in their proper alphabetical positions in the regular REPORTER index, with REPORTER page numbers. A full index of the Proceedings will be printed at the close of the Association's fiscal year, or in the second December, 1922, issue of The REPORTER, in accordance with the decision of the Council In this separate index, page numbers referring to Proceedings only, and appearing at the bottom of Proceedings pages, will be used.

WARP YARN MERCERIZING

(*Continued from page 438*)

overflowing to the pumps, which discharge the liquor to storage tanks in the recovery plant.

The mercerizing action actually takes place in the re- is held under tension by means of the weighted squeeze rolls on each compartment. The compound formed be- moval of the caustic soda by water, while the warp yarn tween the alkali and the cellulose $C_{12}H_{20}O_{10} : 2NaOH$ is decomposed, the cellulose reappearing as the hydrate $C_{12}H_{20}O_{10} : H_2O$.

In order to be assured of the complete removal of the caustic soda, the yarn is passed through 3 per cent solution of sulphuric acid at normal temperature, care being exercised that the warps do not enter the acid at an elevated temperature, and to guard against this conditions the last caustic wash should be cold. The strength of the acid should be maintained within very narrow limits, and frequent titration tests should be made to determine its strength. The acid is removed from the yarn by thoroughly washing with cold water. Too much stress cannot be laid upon complete removal of the acid, since the slightest trace remaining will become concentrated in the subsequent drying operation and cause tendering. In addition to this evil, the faintest trace of acid causes reversion of the cellulose hydrate to cellulose and produces an uneven appearance when the yarn is dyed. In fact, when closely examined the parts dyed lighter in shade have the appearance of unmercerized yarn.

The final treatment on the machine is the softening process, the yarn passing through a weak solution of Turkey Red Oil, or some other oil used for this purpose.

The warps on leaving the machine pass directly to a series of drying cylinders, the number of which depends entirely on the weight of yarn to be dried and the speed at which the operation is conducted. On leaving the drying cylinders the warps are plaited or coiled int boxes, after which the binder thread is removed in a separate operation and the individual warps of 378 ends are split out, in which condition they are delivered to the winding department.

The caustic wash liquors from the machine are evaporated in a multiple effect evaporating system to a concentration of about 80 deg. Tw., and again reused for mercerization. In a well-controlled plant, 85 per cent of the caustic soda used can be recovered.

In order to obtain the best luster only combed yarns should be used, as the fibers lie parallel. The mercerizing process tends to shorten every individual fiber and this shortening is resisted by tension applied in a direction parallel to the axis of the thread. Hence, the greater the angle a thread makes with that axis, the less is the effect of the tension, and if any portion of the fiber is at right angles to the axis, it is not affected by the tension at all. A simple warp thread, therefore, can only receive a partial luster from mercerization, and the greater the twist the less the luster. Slightly twisted threads must give the best luster, although there is a limit to this slackness of twist, for if the cohesion of the fibers is less than the contractile force exerted by the caustic, the fibers slip past each other and no luster is produced. Short staple cotton lusters badly, because it must be more tightly twisted.

Singeing or gassing the yarn prior to mercerizing adds considerably to the resultant luster, as the surface of th yarn is improved by the removal of the hairy fibers, which if allowed to remain, shrink up by the action of the caustic, thereby presenting an uneven reflecting surface.

The luster of mercerized yarn is due to surface reflection, which is brought about by the swelling action of the soda and the untwisting of the fiber while under tension. The fiber thus treated presents the appearance of straight rod with a surface possessing a smooth appearance. The reflecting surface of mercerized cotton may be compared to the surface of still water, whereas the wrinkles on the surface of unmercerized cotton correspon to the small waves when the water is disturbed, the reflecting surface becomes dull as the rays of light are scattered in every direction.

The Dawhoo Chemical Company, Charleston, S. C., has been chartered under State laws. The incorporators are J. P. Matthews and E. Hisher, both of Charleston.

Jersey Knitting Company, Springfield, Mass., has been incorporated with capital of $50,000. It is a part of the Potter Knitting Company, and will take over the colored goods department of the latter. The incorporators are Theodore W. Ellis, John H. Mitchell and H. L. Coolidge.

A system of licensing for imports of dyestuffs into Japan has been proposed and will likely be adopted within the next few months, American Trade Commissioner Butts, at Tokio, cables to the U. S. Bureau of Foreign and Domestic Commerce. Mr. Butts states, however, that the system is not expected to be inaugurated in less than three months, and that the public will be given advance notice of at least thirty to sixty days.

The John Cowan Chemical Company, Ltd., 179 Common Street, Montreal, Que., is planning for the rebuilding of the portion of its plant destroyed by fire April 26.

The Hooker Electrochemical Company, of Buffalo, has purchased for $130,000 the chemical plant of S. Wander & Sons Company, at 135 Church Street, Albany, N. Y. The sale was made by order of Edwin A. King, referee in bankruptcy. S. Wander & Sons Company were recently adjudged bankrupt.

The Padder in the Dyeing of Cotton Piece Goods

A Paper Presented at the Twenty-first Annual Meeting of the Alumni Association of the Philadelphia Textile School

By JOSEPH M. KAEPPLER

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MUCH depends upon the ability of the operator in getting the best quality of dyeing from a padder. In a large plant where the foreman cannot give his personal attention to the necessary repairs for the machines, the operators must be considered as semi-skilled laborers. In this case a bonus system would work to good advantage. By the good work of the operators the foreman can have all his padders turning out first-class dyed goods.

There are many reasons why unsatisfactory results are obtained or faults crop up in the use of a padder. Padder dyeing is carried out at a speed of about 160 yards per minute. It requires, first, a thoroughly boiled-out fabric that is absolutely and uniformly wet out immediately it is brought in contact with the dye solution. If at any time in the process of dyeing a lot the goods should show a cloudiness or resist because of insufficient kier boiling, the attention of the foreman should be called to note this.

Defects in the squeeze rollers is another thing, to detect which a good padder-man will always be on the alert. He should show care in not letting knotty sewings go through the nip of the squeeze rollers, as frequent occurrence of this will cause a series of dents to form in the rubber rollers. This is especially true if the rubber is very hard or has had long service and been buffed off many times. These holes or dents produce a cloudy and mottled effect which can be corrected with no little extra cost to the lot.

Pieces in this condition usually find their way to the chemic pits, where they are stripped of the color and returned for redyeing. If a padder dyer never has goods to strip he will always turn out good work, because a redyed, stripped lot will very rarely pass as first-class goods. It seems that any amount of care can be shown in the souring off, but there is always just a small quantity of chlorine in the fabric to change the dyeing from normal. Of course, all the pieces of the lot will not contain the same amount of chemic, so this means any number of cast in the resultant goods. If this is the case, the packer will find that he has D and E shades to pack as well as A, B and C. In other words, five shades or more will be the result in the complete lot.

Stripping not only reduces the quality of the color but also lessens the value of the fabric. Many times in the process of removing the color the tensile strength is reduced 15 per cent more.

Cloudiness in a piece cannot always be removed as readily as would be thought. While stripping will remove it to the extent that it will not be as noticeable as when first dyed, the unevenness is never completely eradicated. When treated with chemic most dyed shades are prone to revert to yellow bottoms and the result is that the heavy places in a cloudy piece will show a deeper cast of yellow than the lighter areas upon stripping. Upon redyeing the goods this fact will influence the shades, and while there will always be an improvement over the first appearance, there still remain slight signs of cloudiness.

A dust hood over a padder is a very necessary piece of auxiliary apparatus if clean goods are wished for. It might not only serve to keep floating lint and dust from the goods and rollers, but will catch the contents of an oil drip pan that has been knocked from a shaft hanger by a broken belt. In the latter case the oil might be of a large volume and soon drip through the cloth dust hood, but it will, nevertheless, give the operator an opportunity to move the goods without serious damage. The hood can be made of gray goods seconds and tacked over the padder in tent fashion above the overhead tension rails. It is to an advantage to make it of damaged material, as the hood should be cheap enough to throw away. They soon get dusty and filled with grease; then it can be torn down and replaced by a clean cloth. It should extend over the batching-up machine, in order to give protection to the dyed goods as well as to the front end, under which the goods are in the white. Dirty hoods are almost as troublesome as no hoods at all, so it is very necessary to give them frequent dustings. Night seems to be the proper time to do this, after all the machinery is shut down and no damage can be done the rubber rollers. All the dust will be settled by the next morning, and can then be swept up with damp sawdust. This will, however, not be necessary if most any one of the numerous patent anti-dust treatments has been given the floor.

Even with this hood protection for the goods, it is necessary to clean the rafters or I-beams of the padder room, as these unfailingly collect a thick layer of oily dust or lint. An ordinary breeze from a ventilator can loosen a piece as large as a hand and float it in the air for 15 or 20 feet, at the end of which it might fall on some cloth and cause a huge grease spot that is difficult to remove.

When the goods are being threaded through the overhead tension rails the operator should be sure that he has led them beneath enough rails to give required drag, or the goods will snap or flop when being run from the lap. The flopping of the goods will cause the dye liquor to splash away from the nip, and the result will be spots in the finished piece. These spots resemble those produced by dents in the rubber rollers, but they will not appear periodically like the latter. Careless threading of the overhead tension rails will yield a series of spots throughout the pieces, and the making-up department will lose at least half a yard from each set of spots. It is difficult to tell how many short pieces a double cut will yield if the flopping once starts at the front end of the padder.

A 1½-inch brass pipe rigged very securely close to the bottom roller and about 2 inches below the level of the nip will act as a hood bar. This prevents the hot dye liquor from flooding out over the cloth, thus streaking it. It also helps a great deal toward keeping the goods straight while passing under the spray pipe of the dye liquor, thus preventing nipping. This flood bar will not replace the stretchers of a padder, but will keep the goods spread out if they are passed through a Mycock stretcher or over a crimp bar placed about a foot or foot and a half from the nip.

Brass rollers have been successfully substituted for rubber in the bottom rollers of a padder. This does not hold good for all grades of goods, as the trouble lies in shifting from dark to light shades. Light cloth of plain weave can be run without any harm, but twills and pocketing will cause no end of trouble. The brass foundries are unable to cast brass rollers without numerous little pits or holes occurring on the surface. Turning the rollers down on the lathe does not improve the surface, but rather reveals additional holes. The concentrated dye liquor of the dark shades gets into these little pits, and if allowed to dry overnight will crystallize. It is then in readiness to cause trouble for the dyer when he wants to start running a light shade. Instead of the customary fifteen or twenty minutes for chemicking out a machine, the brass rollers will necessitate a one to one and one-half hour's cleaning. Even then it is often necessary to run cast-out seconds to absorb the dye from the pit holes in order to complete the cleaning. Where a machine runs but one shade, or where thin goods only are dyed, a brass roller will be a saving, as the initial cost is the last. They can be run indefinitely without being buffed off, while the double rubber rollers need constant attention, or the machine will be turning out pieces with light selvages and dark centers. This same trouble can be had with a brass and rubber roller padder, but there is only one roller that needs to be looked after in this case.

The majority of the shades dyed by a padder are light, and consequently show dye specks and iron rust very readily. Probably the best plan for putting a stop to this is to outfit the padder completely with brass and lead fittings. Lead can be used for linings of the tubs and roller boxes, while brass pipes and fittings should be used for the water supply lines, with the same for the dye liquor feed pipes. This will stop rust spots; but the hardest of all spots to stop occurring are dye spots.

Without a doubt they are caused in most cases by the proximity of the drug room to the padders. The drug room is best that is removed as far as possible from the padders. It should be provided with a swinging door and this kept locked and used as infrequently as possible. It is rather a good plan to have a low sliding door through which the drug-room man can serve out the dye pails. Before he hands them through the window he should assure himself that all the dye has been dissolved and no dry particles are floating upon the top of the dye liquor.

Some dyes are so hard that they refuse to absorb water and, even after repeated stirring, float on the surface, ready to be wafted away by the first current of air into the padder room. This can be overcome to a great extent by first working the dye into a paste with a small quantity of water, and then diluting to a perfect solution. This is not necessary with all dyes, as some are so very soluble that just a quantity of water dashed on them will completely and immediately dissolve them.

The minimum amount of caution and trouble in dissolving dyestuffs can only be obtained by constant daily practice in the drug room. The help in the drug room should be instructed to never fill a dye pail to the top. A full dye pail is not only inconvenient to carry, but especially dangerous if filled with hot water. This dye liquor when it is splashed on the floor will evaporate, and since it is a concentrated solution the dye will crystallize. Then it will be loosened and kicked into the air, only to light on some sample piece of cream or light tan shade.

The washing of dye measures and pails after they have been returned from the padders to the drug room is also worthy of note.

In weighing out dyestuffs all manner of care can be shown, but there will always be some of it split on the table upon which the balances rest. The most natural thing for the help to do would be to set the dye pail and measure on this table that is nearest to them. In doing this the dyestuff adheres to the bottoms of the measures and is in turn carried out into the padder room. Each measure should be washed thoroughly after returning to the drug room. Another good way to remedy this fault is by having a shelf built overhanging the balances about the height of a man's shoulder. Divisions can be made on this shelf to keep the measures of each machine in their respective order. The drug-room man must then form the habit of setting the measures in no other place than on the shelf. Clean paper might be placed on the shelf as an added

precaution, and renewed every evening just before the workmen leave.

In addition, the drug-room help should not be permitted to walk around the padders. Their clothing is usually covered with a fine dye powder, which will inevitably drop off and float in the air, only later to cause some trouble. The writer recalls an incident where all the pieces turned out by a certain mill for a period were well spotted with blue dye spots. An entire afternoon was taken up in sweeping and washing the floors, walls and overhead beams. The next morning work was resumed with all confident that the blue specks had gone with the cleaning; but they had not. By chance one of the help leaned against a damp roll of goods that were freshly dyed. The result was a mass of blue where his clothes had come in contact with the damp cloth. That evening all the workmen were asked to wash their clothing and instructed to return with clean garments the next morning. Dye specks became a rarity after that, and later disappeared altogether.

There is no other department that can help the starching room make gains in yardage as much as the padders. Some padders batch the goods upon wooden centers or rollers by putting the gudgeons in a swinging bearing, then wrapping the cloth about the roller and resting it against the upper squeeze roller. This type of padder when stopped damages about the smallest amount of goods than any other. When the roller is filled with the batch of goods the padder can be stopped with but a few inches of the next piece through the nip of the squeeze rollers. The cloth can then be torn at the sewing and the full batch swung out of place, while the few inches of the new piece are twisted around an empty center, ready to run up another batch.

Another method of batching-up is a separate machine placed at the back end of the padder, which is driven by a belt from a pulley forced onto the shaft of the drive squeeze roller. The "batching-up" rigging consists of two brass rollers about 10 inches in diameter, upon which the batch roller is placed and revolved, thus winding up the goods. This type batching arrangement is usually low, and it is necessary to put it 2½ feet from the nip of the squeeze roller so that the large roll of cloth will clear the dye box. This distance causes considerable loss of goods every time the machine is stopped, and calls for some attention to reduce the loss to a minimum. An excellent plan for stopping this loss is to have the sewing room sew end cloths on both ends of the batches. They should be cut at least 2 yards long, and longer if possible, and could be made from seconds out of the gray room.

Hydro Extractors: Their Use and Abuse

Causes of Trouble—Personal Element—Basket Deterioration—Neglect—Improper Loading—Defective Materials—Fatigued Materials—Excessive Speed—Ignorance—Lack of Proper Precautionary Measures May Produce Irksome Legislation

By HARRY H. STEPHENS

NUMEROUS articles pertaining to centrifugal hydro-extractors have been published, presumably for the guidance of users of high-speed apparatus, but in most cases the major portion of the article was given over to a discussion of forces and stresses, involving complex technical formulae, thus greatly impairing its value for the busy plant manager or superintendent, who has little time to wade through such figuring, and usually cares less, as he feels that if the extractor is properly designed he need not worry, as that is up to the extractor manufacturer.

From reports of insurance companies we can trace the cause of many extractor difficulties down to: (1) Personal element; (2) basket deterioration; (3) neglect; (4) improper loading; (5) defective materials; (6) fatigued materials; (7) excessive speed, and (8) ignorance.

Personal Element.—This is by far the most important cause of any, for it embraces every person that has anything to do with the extractor from the time it is designed down until it is scrapped. The designer must be competent. The manufacturer must see that these specifications are lived up to, and make constant tests to be sure material is as specified. The purchaser is responsible in the selection and buying of an extractor to secure a machine that will safely and satisfactorily do this work, and therefore his selection must be governed, within reason, first, by quality, then by price.

Basket Deterioration.—All baskets deteriorate with use, as far as physical strength is concerned, for the constant vibration to which these are subjected sooner or later will result in a weakening, due to crystallization of the basket material.

In addition to this, baskets that are used in contact with certain chemicals are subject to erosion by the chemicals. Unless temperatures are high—say, over 90 deg. Cent.—and unless the basket is subjected to severe handling, a method sometimes used is to coat the basket with hard rubber. However, even a fine crack in the vulcanized rubber will admit acid, which may cause eating away and weakening of the metal under the rubber. This cracking can be detected by applying an electrical test of about

2,000 volts to every portion of the basket when new; and this same test should be applied about once every three months, to detect any flaws that may have occurred in use. In the matter of rubber-covered baskets, only very stiff baskets should be used.

Many failures of rubber-covered baskets are due to the type of centrifugal in which the basket is run, and the worst offender is the old style extractor, or whiz, of which there are many still in use, especially in the silk throwing and dyeing and finishing trades. This extractor is constructed with rigid or fixed bearings, one bearing above and one below the basket; the outer casing being fastened securely to a large concrete foundation in the belief that by bolting such a machine down tight, it is made safe. In reality, the machine is made more dangerous by being fastened down tightly to a foundation, because the basket, even when badly out of balance, is compelled to rotate around a fixed center setting up tremendous strains in the basket, springing and distorting it out of shape, the result being that with a rubber-covered basket this continual springing of the basket out of shape very quickly cracks or ruptures the rubber coating and then the damage is done, for with an acid eating away and weakening the basket wall, the extractor soon becomes a dangerous machine to run. It therefore follows that a self-balancing extractor is the better type for uses where rubber baskets are necessary.

Neglect.—This is chiefly in evidence in connection with the operation and maintenance of the extractor. The writer has been in textile plants and seen extractors in constant operation that were without question absolutely dangerous, and to run a machine in such a condition is nothing short of criminal. He has seen repairs made on baskets where old material was used to save a few dollars, when the only fair thing to have done, both to themselves and to their employees, would have been to properly rebuild the basket. Yet the plant superintendents were apparently satisfied to run a little longer with a defective basket.

Improper Loading.—It cannot be disputed that any extractor will operate more efficiently, be freer from breakdowns, and have a longer life, if it will run free from vibration, for constant vibration will surely wear down and eventually destroy any piece of mechanism. When the extractor is completed by the manufacturer it is usually subjected to a running test for balance, and if properly erected the extractor will run smoothly if properly loaded. It is extremely important, therefore, that care be used in loading baskets evenly. The practice of loading two heavy bags of piece goods in a large basket directly opposite one another should be prohibited, and the load should be spread more evenly around the basket, because no extractor baskets are designed to carry a concentrated load at two points, and this will spring the strongest basket out of shape, and may cause a basket failure.

Many persons believe that the so-called "self-balancing" extractor will overcome all uneven loading. This is a greatly mistaken assumption. In the first place, the term "self-balancing" as applied to extractors is a misnomer. No centrifugal possesses any real self-balancing features, for that would mean ability to run with excessive out-of-balance loads. "Self-balancing" extractors are self-balancing only by virtue of the character of load in the basket. If it is a non-flowing or not a self-adjusting load, like textile material, the machine will vibrate if not loaded evenly. On the other hand, in chemical work, like the handling of salt or sugar, where the load has a tendency to evenly distribute itself around the basket during the starting period then the so-called self-balancing extractor merely accommodates itself to the uneven load during starting. It is extremely important also that the extractor must not be overloaded beyond the amount the basket was designed to carry at the operating speed.

Defective Materials.—This has to do with the selection and use of proper materials in the extractor baskets, spindles, and bearings, as originally made by the extractor manufacturer, and also—just as important on the owner's part—the proper use of suitable materials in making repairs or replacements.

Fatigued Material.—It has been proved by actual tests that when most materials are stretched in use beyond their elastic limit, naturally with the reduction in sections the strength of that metal is considerably reduced. Now this is exactly what happens when you try to repair or reshape an extractor basket whose well or drum has stretched or bulged in operation. It is common practice to hammer a drum back into shape; but no amount of hammering can restore the strength.

Excessive Speed.—This may be caused either intentionally or unintentionally. Most persons do not appreciate the tremendous increase in the metal stresses of the basket caused by an apparently slight speeding up. For insetnce, if the speed on a 42-inch extractor, which normally runs at 850 r. p. m., be increased to 1,150 r. p. m. (only about 40 per cent increase), the basket strains are doubled and the factor of safety cut in half. In many textile processes there is a remarkable gain in economy of subsequent handlings if the extractors are run at comparatively high speed, and there is a great tendency towards higher speeds than were formerly used. This is all right if the extractors are properly constructed for these abnormal speeds, but it is a dangerous proposition to promiscuously speed up old machines without the advice of a competent engineer.

Steam-engine-driven extractors are likely to give trouble on account of excessive speed when their governors have been tampered with, or, as is sometimes the case, removed altogether. This puts the control of speed too much in the operator's hands; it is not only dangerous, but gives a product that is anything but uniform. The engine should be of suitable size to drive the extractor with the minimum steam pressure, and a positive pressure-regulating valve should be placed in the steam feed line beyond the operator's reach, so as to preclude the possibility of excess speed.

Extractors are often operated at a greater speed than necessary, due to the mistaken assumption that equal peripheral speeds develop equal centrifugal forces, and consequently give like drying effects. To disprove this, imagine yourself in a railroad train, traveling, say, 60 miles an hour. You will hardly notice going around a very gradual curve, but if the engineer attempted to take a sharp curve at the same high speed you would probably find yourself trying to go out of the window. Here is a case of equal peripheral speeds where centrifugal forces are entirely different, demonstrating that centrifugal force is proportional to angular velocity, not peripheral speed. It varies directly as the size of the basket and weight of load, but as the square of the speed.

Ignorance.—Most employers expect to and usually do trust the actual operation of their hydro-extractors in the hands of an unintelligent class of labor. Therefore, if the owner admits his help are ignorant, he must not expect them to act otherwise, and for obvious reasons he should not place in the care of such help any apparatus that will require thinking on the operator's part. He must, therefore, furnish the operator with an extractor that cannot be run at excess speed, and one in which the operations are so simplified that he does not have to think. If the owner does otherwise, he is acting in direct opposition to what he admits to be a correct and logical handling of the matter, and he is putting in the hands of unskilled or reckless workmen a chance to jeopardize lives and property. Many accidents are the direct result of recklessness or skylarking on the part of the employees, together with the inborn curiosity in all human beings to see what happens if they try something new.

Another brand of ignorance is thoughtlessly changing the speed of shafting which drives extractors as well as other machinery.

On the other hand, extractor manufacturers are greatly to blame for the ignorant handling of their extractors by manufacturers and operators. It seems almost incredible that any manufacturer would market a piece of high-speed machinery like an extractor without fully informing the operator in an effective way the maximum conditions under which the extractor should be run. Surely excess load and speed is the cause of many accidents, and yet some users are absolutely ignorant of what the limitations of their extractors are in speed and load, and they consequently make changes to suit their operations, trusting more to good luck than to good management.

Yet another case of ignorance is found in the practice of having extractors repaired or baskets rebuilt in shops not fitted either in equipment or in knowledge for such special work. It is a dangerous practice to have a boiler shop that knows nothing of basket design repair a basket, for the results and risk involved are not justified by the few dollars possibly saved. Such shops cannot know what is required, and cannot be expected to produce safe baskets. Making one basket look like another does not insure its being of the same strength, and it usually pays in the end to go to the concern that originally made the extractor for any repairs or new parts.

Ignorance in applying the extractor to the job is often caused by the customer, in his anxiety to keep his process secret, giving the extractor manufacturer the scantiest of information. The result may be that of a customer asking for an extractor to perform quite an impossible task, or a manufacturer supplying an extractor which is afterwards found to be unsuitable.

To most persons an extractor is only a machine that rotates quickly; they do not realize the tremendous energy stored up during operation, and how fraught with possible danger the operation of these machines may become if they are run carelessly. While accidents will happen even in spite of the best of intentions, yet we must realize that if accidents become too numerous, the next step toward prevention will be extreme legislation that may impose great burdens on owners through unwarranted restrictions, requirements, etc. Therefore, let manufacturers produce only extractors that are as good as they can possibly be made, and let purchasers buy only the best and keep them in the best of condition. Then, and then only, shall we have done our share toward the proper use of centrifugal extractors.—"Cotton."

FIXATION OF ALIZARINE RED IN CALICO PRINTING

A sample of bleached calico prepared with Turkey red oil was printed with a paste containing 100 grams Alizarine V 20 per cent, 500 grams neutral starch-gum tragacanth thickening, 100 grams aluminium thiocyanate 15 deg. Be., 30 grams of calcium acetate 15 deg. Be., 100 grams of acetic acid 78 deg. Be. and 170 grams of water. It was afterwards steamed to develop the color, and then thoroughly washed with hot and cold distilled water. Analyses of the printed fabric and the wash liquors showed that about 33 per cent of the alumina, 70 per cent of the lime, 10 per cent of the alizarine and 14 per cent of the Turkey red oil were removed from the printed fabric by washing.

In separating the oil from the alizarine, use was made of the solubility of the oil and the insolubility of the alizarine in petroleum. Distilled water was used for washing instead of a soap solution (as in large-scale practice), since with soap, fatty substances are fixed by the printed parts of the fabric.

When a printing paste, in which the constituents were diminished according to the above losses in washing, was used, very inferior shades were obtained. Hence, in printing alizarine a certain proportion of the color lake will be always unfixed and thus be removable by washing. In this respect the fixation of alizarine on cotton is similar to that of indigo.

A Cross-Index of Green-Schultz and Schultz-Green Numbers

By H. WALES

(Sixtieth Contribution from the Color Laboratory, U. S. Bureau of Chemistry, Washington, D. C.)

THE following tables giving the numbers in Schultz's Farbstofftabellen 1914 edition, which correspond to the numbers in Green's Systematic urvey of the Organic Colouring Matters, 1908 edition, have been prepared for use in the Color Laboratory, U. S. Bureau of Chemistry. Several Schultz dyes are given in footnotes in Green. In such cases the Green number is given in italics.

GREEN-SCHULTZ NUMBERS

Green Nos.	Schultz Nos.
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7	31
8	137
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10	35
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84	143
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86	145
87	138
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89	142
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91	140
92	141
93	146
94	23
95	134, 136
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175	274

Green Nos	Schultz Nos.
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177	262
178	263
179	—
180	275
181	Sulphonated 275
182	276
183	266
184	269
185	267
186	—
187	270
188	272
189	271
190	294
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209	434
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214	484
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219	317
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225	340
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227	344
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229	348
230	349
231	345
232	346
233	—
234	319
235	314
236	306
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238	310
239	309
240	307
241	316
242	312

Green Nos.	Schultz Nos.
243	313
244	320
245	321
246	322, 378, 409
247	324
248	327
249	328
250	329
251	333
252	326
253	334
254	337
255	354
256	352
257	353
258	331
259	356
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268	376
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Green Nos.	Schultz Nos.
310	408
311	410
312	411
313	417
314	412
315	418
316	421
317	423
318	419, 422, 424
319	426
320	413
321	414
322	416
323	428
324	427
325	429
326	430
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364	443
365	449, 454, 457
366	453
367	455
368	461
369	459
370	460
371	478
372	474
373	475
374	467
375	468
376	470

Green Nos.	Schultz Nos.
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381	481
382	482
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415	16
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417	770
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422	773
423	774
424	775
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Green Nos.	Schultz Nos.
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Green Nos.	Schultz Nos.
511	586
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538	782
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548	786
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576	681
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Green Nos.	Schultz Nos.
578	—
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580	670
581	678
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584	679
585	680, 683
586	682
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Green Nos.	Schultz Nos.
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655	663
656	667
657	665
658	618
659	616
660	198
661	51
662	614, 615
663	617
664	611
665	610
666	612
667	613
668	706
669	707
670	717
671	718
672	732
673	738
674	721
675	715
676	737
677	709
678	724
679	719
680	722
681	744
682	728
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684	741
685	743
686	742
687	776
688	749
689	874
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691	876
692	877
693	878
694	888
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696	930
697	924
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703	939
704	028
705	937
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707	936
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SCHULTZ-GREEN NUMBERS

Schultz Nos.	Green Nos.
1	394
2	396
3	397
4	398
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6	3
7	4
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9	399, 400
10	401, 402
11	405, 406
12	403
13	407, 408
14	411
15	409
16	415
17	416
18	404
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23	94
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Schultz Nos.	Green Nos.
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262	177
263	178
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266	183
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346	232
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351	221
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356	259
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522	490
523	446
524	462
525	463
526	465
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Schultz Nos.	Green Nos.
529	467
530	468
531	475
532	469
533	474
534	471
535	476
536	477
537	478
538	479
539	480
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CHEMICAL FIRE HAZARDS

(*Continued from page* 440.)

Grinding or Milling is a frequent cause of trouble, due to friction, spontaneous heating or presence of combustible dust, especially in high-speed attrition devices. Undoubtedly the safest types of grinding apparatus are some of its many excellent forms of ball mills, which may now be procured in all sizes and kinds from those of only a few grams' capacity, for laboratory use, to the largest size.

Evaporation or crystallization is usually devoid of any hazard except the indirect one of largely increased corrosion of electrical fittings and sprinkler equipment (where there is any), where acetates, or the like, are prepared, due to vapors of an acid nature in presence of steam or water vapor acting on brass, copper or iron.

Crystallization from solution in inflammable organic solvents is hazardous, especially when the solvent is recovered and special precautions are required.

Filtration is not usually hazardous except where the press cake remaining from its operation consists of such material as fuller's earth, bone black, or the like impregnated with readily oxidizable substances, in which case it may be a severe hazard if this is not immediately removed to a safe place and the filter cloths washed and dried.

Distillation of inflammable organic liquids is always attended by more or less hazard and this is usually so obvious that almost everyone recognizes it and takes special precaution as to electric lights, switches, fuses or similar devices. The principal cause of trouble in distillation is from the breaking of glass sight boxes or guage glasses, blowing out of pressure guage fittings and carelessness around tail pipes or discharges from condensers.

Autoclaving, sulphonating, caustic melting, and similar operations conducted at high temperatures and pressures are a frequent cause of explosion followed by fire and these should be carried on in rooms or buildings of noncombustible construction with light roofs. When the nature of the case permits relief or vent pipes to open air should be provided and if necessary safety discs or plugs may be devised that will rupture in case of overpressure.

Reduction is frequently a source of danger, especially when such highly reactive materials as zinc dust are used. The reducing material should be fed in in small quantities at regular intervals and the reaction carefully watched by experienced employees who have sufficient sense to call the supervising chemist or other skilled person if the reaction appears to be getting beyond control or any un-

usual phenomena are noticed. Operations of this nature, when hydrogen is evolved, are especially risky.

Nitration is always hazardous, even when no more than the first stage or mononitration is carried on. I believe that there have been more accidents or fires caused by this process than almost any other one thing. The substances nitrated are nearly always of a highly combustible nature and there have been a number of accidents due to nitration of benzene or toluene that seems to be utterly unexplainable except on the general proposition that nearly all nitro-compounds are comparatively of an unstable nature and are prone to eccentricities.

Chlorination is not usually hazardous if proper precautions are taken in handling the storage of benzene, toluene or other inflammable liquids except that chlorination of toluene or similar compounds in glass flasks frequently in close proximity to a powerful electric radiant, is very hazardous and should be carried on in some place where the fire resulting from a ruptured flask would cause little damage.

Sublimation is usually a hazardous operation, especially in case of camphor, naphthalene, beta-naphthol, salicylic acid and similar substances which are highly combustible, especially in a fine state of subdivision. There have been a number of serious fires and accidents directly due to improperly constructed or carelessly operated sublimers.

The general subject of heating is of prime importance. Steam heat is unquestionably the safest and probably a properly arranged and safeguarded oil circulation is the next best where high temperatures are required. Open gas flames and direct coal or coke fires are highly dangerous and should be avoided. Where a coal or coke fire is an absolute necessity great care should be taken in arrangement of fire pit and when the substance heated is of a combustible nature the firing should be from outside the building and care should be observed so that by no possibility could inflammable substances boil over or froth over onto a hot flue, and in all cases heated kettles should be vented to open air by pipe of ample size or if open fans are used they should be under a hood of ample size.

Hazardous Chemicals

First, the strong acids, sulphuric, nitric and hydrochloric; these, while not hazardous in themselves, are likely to make trouble if they are brought in contact with other compounds but, as usually handled and stored, do not constitute a serious hazard, their properties being so well known they are in the very nature of things usually kept in a safe manner. Possibly nitric acid is more hazardous than the others, as there are cases known of serious fires caused by its leaking onto organic matter, such as hay, straw, dust, and so on.

Probably the most seriously hazardous chemicals, outside of those known to be of a positively explosive nature, are those containing a large percentage of oxygen, namely, the nitrates, chlorates, peroxides of the alkali metals, picrates, permanganates, and so on. These, while not inflammable in the ordinary sense of the term, give up their oxygen content so readily, especially in the presence of readily oxydizable material, that their presence in a fire possibly originating from some other cause is nearly always productive of disastrous results. There are a few compounds met with that are apt to be hazardous in presence of moisture, as sodium peroxide, calcium carbide, zinc dust and other finely divided metals, lime, and possibly caustic soda under certain conditions.

Certain coal-tar colors and intermediates are thought to be hazardous to some extent, for instance, certain sulphur dyes, and nitrosophenol. The hazards of such articles as phosphorus, metallic sodium and potassium are well recognized and there are comparatively few places where they will be met with outside of a laboratory. Inflammable gases are rarely met with, the commonest being hydrogen which is generated during the course of a good many reactions, especially those of an electrolytic nature. I am inclined to think that hydrogen has been to blame in a number of fires of an obscure or unexplainable nature. Acetylene is dangerous but there are not many manufacturing processes where it is likely to be generated.

Probably the preponderating hazard in chemical plants generally, and that responsible for a great many fires, is the use of the organic solvents. These are all more or less volatile at ordinary temperatures, and they are all readily inflammable in the liquid as well as the gaseous phase. They form in the gaseous condition easily inflammable and more or less explosive mixtures with air. These are principally the various alcohols, ethers, ketones, benzene, toluene, xylene, etc. Probably the most hazardous solvent ordinarily used is carbon disulphide. More than ordinary precautions should be taken in its storage and use, and any processes wherein it is used; for example, as a solvent in the making of rubber cement or as a raw material in the manufacture of thiocarbanilid, should be confined to small and well detached buildings of small value.

The solvents derived from petroleum are rarely met with in chemical practice except occasionally as a means of extracting alkaloids, and perhaps for washing certain precipitates or residues. As a matter of fact most fires of any note in chemical plants falling under the writer's observation, have been caused by downright and reprehensible carelessness, and could have been avoided. — "Drug & Chemical Markets."

Large manufacturer has good opportunity for dyestuff salesman who is well acquainted with woolen and worsted mills in Rhode Island and Connecticut. Reply to Box 213, American Dyestuff Reporter.

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Your selling agents want to guarantee your cotton goods to be

permanently white,
not weakened in bleach,
of highest softness and elasticity,
odorless.

Only the Peroxide Bleach can cover these points.

We will teach you free of charge.

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41st Street and Sixth Avenue
New York, N. Y.

"NATIONAL" NEWS

Of interest to Dyers and the Color Using Industries in General
Prepared by the National Aniline & Chemical Company, Inc.

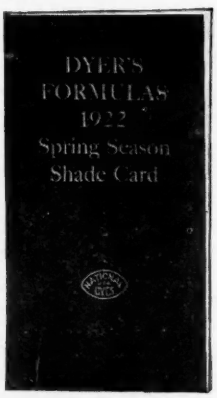
COLORS FOR SPRING

The "National" Announces New Issue of Dyer's Formulas

FOR 1922 SPRING SEASON

Dyers of silk, cotton and wool will find of great practical value our booklet of Dyer's Formulas that has just come from the press. The recipes have been prepared by "National" research colorists for matching the shades in the 1922 Spring Season Shade Card, issued by The Textile Color Card Association.

It is the aim of the "National" to exercise such care in the choice of the dyes recommended as to insure to dyers following recommendations made, the highest degree of favorable results.



Formulas are given for the use of "National" Dyes in reproducing on cotton, silk and wool the fifty-six evening shades, ten hosiery colors and the five shades carried over from last season, as well as formulas for the fourteen special woolen colors.

The matching of shades on any material, co-operative effort in solving problems, and the supplying of special technical data on the application of dyestuffs, are important features of "National" Service.

This group of Dyer's Formulas serves a practical purpose and meets a present need. If you have not already received a copy, write to our nearest branch office, which will be glad to supply you.

WHAT QUALITY DO YOU DESIRE MOST IN DYESTUFFS?

Uniformity, Shipment by Shipment?

Very Well, Here It Is!

The "National's" method of standardizing every step in the manufacture of dyes, commencing with the initial raw material, checking and cross-checking under the control of a trained inspection service, insures that the final product shall always be of a scientifically fixed quality.

NATIONAL ACID GREEN L EXTRA

For Wool and Silk

ESPECIALLY USEFUL FOR WOOL AND SILK MIXTURES

The National Aniline & Chemical Company, Inc., offers an extremely useful type of Acid Green for wool and silks, under the above designation. This new product possesses excellent solubility, dyes level, exhausts from the dye-bath very well, and is therefore of great value to dyers of piece goods.

National Acid Green L Extra is fast to perspiration and organic acids, while its fastness to water, decatizing and rubbing is good.

Besides its usefulness for woolen fabrics and yarns, it will find general application for wool and silk mixtures, both fibres being dyed the same shade. Other uses outside the textile field for which it is applicable are the manufacture of lakes for paints and printing inks, leather staining, feather dyeing, and in the compounding of writing inks.

Samples, together with practical dyeings, accompanied by full working details, will be supplied to all inquirers upon request.

National Aniline & Chemical Company, Inc.

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THE FIRST AND LARGEST MAKERS OF COAL-TAR DYES IN AMERICA

NATIONAL DYES

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permanently white,
not weakened in bleach,
of highest softness and elasticity,
odorless.

Only the Peroxide Bleach can cover these points.

We will teach you free of charge.

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41st Street and Sixth Avenue
New York, N. Y.

New Color Card For Cotton

THE products listed in this recent publication comprise the most important of "National" Direct, Developed, and Basic Dyes.

No less than 210 dyeings are shown, representing 105 dyes. General directions for dyeing cotton are given, including special methods for after-treatment.

An important innovation is a presentation of a table of dyeings explaining the fastness properties of each one of the dyes included in this sample card.

The illustration above shows the form used. Instead of being simply indexed and indicated by numerals, the information is given in plain, non-technical language, so that it may be easily understood and utilized.

Copies of the new Cotton Card may be secured from any of our branch offices.

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QVALITY COLORS
UNITED STATES COLOR AND CHEMICAL CO. INC. ©

Anthranol Chrome Blue Black AR

Dyes chrome mordant or top chromed. Recommended for fast shades of navy blue or all classes of stock. On account of its shade, level dyeing properties and solubility it is especially suitable for piece dyeing.

Anthranol Chrome Brown W

Dyes chrome mordant or top chromed. Is fast to light and fulling. The most level dyeing brown on the market.

Acid Chrome Blue F 4 B

Similar to the pre-war Chromotrope F4B. Of special interest for dyeing piece goods to leave silk white.

United States Color & Chemical Company, Inc.

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Standardization of "National" Products

A "National" dye is never offered to the trade until it is so standardized that it can be duplicated at any time with scientific accuracy.

So fully do we realize the importance of standardization, that this is the controlling influence in our production—not an incident to it.

We maintain a special staff of experienced chemists whose sole duty it is to secure uniformity in the finished dyestuffs. And to enable these chemists to perform that duty with the utmost precision, they are vested with authority to halt any manufacturing process if any deviation from our exacting standards should occur.

The standardization of "National" products begins with the raw materials, which are all carefully examined and tested. There then follows, at every stage in production, a series of precise tests—a complete system of checks and counter-checks—which insure finished products of absolute uniformity.

This carefully devised method of standardization makes it possible for the dye-consuming industries to employ "National" products with entire confidence, year after year in their own combinations.

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To be a permanent white;
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to be soft and elastic;
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"NATIONAL" NEWS

Of interest to Dyers and the Color Using Industries in General
Prepared by the National Aniline & Chemical Company, Inc.

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Prompt Deliveries?

"National" Facilities Take Care of That

One of the things that the textile manufacturer demands from dyestuff manufacturers is prompt delivery of his requirements.

This can be guaranteed only when an extensive study has been made by the dyestuff manufacturer of the needs of the textile trades, and when he has balanced his manufacturing processes so that he has on hand, at all times, a sufficient supply of stock to meet all probable requirements.

The National Aniline & Chemical Company, Inc., has made this study and carries a supply of dyes in its warehouses and branch offices which enables it to promptly fulfill all requirements.

DYES FOR SOAP

Manufacturers of soap will be interested in the sample card recently issued by the Dye Application Department of the "National."

Eighteen samples of soap cakes are shown, colored with the following dyes:—

National Soap Yellow W
National Soap Yellow M
National Soap Orange AC
National Soap Red F
National Soap Red R
National Soap Blue N
National Soap Blue G
National Soap Violet S

General directions for the coloring of soap are given, together with the formulae used in securing each of the eighteen shades.

Any of the Company's branch offices will gladly furnish more detailed information.

NATIONAL WOOL GREEN S

For General Utility

Dyers of worsted and woolen yarns and piece goods will find a useful addition to the acid dyes in National Wool Green S, because of its excellent level dyeing properties and its all-round good fastness.

This well-known product may be successfully employed in the production of mode shades in worsted and woolen dress goods and is one of the few dyes that may safely be added to the boiling dye-bath for shading purposes.

The general utility of this new "National" product is indicated by the fact that the dyer of silk may employ it on either weighted or unweighted silk. It is also extensively used for dyeing carpet yarn.

After-treatment with bichromate somewhat improves its fastness to light and washing without materially altering the shade.

BASIC DYES FOR PAPER MAKING

To Meet the Requirements of the Trade in Every Phase of Paper Dyeing and Staining

"National" basic dyes possess unusual brilliancy, excellent tinctorial strength, and good solubility. In addition, their great affinity for unbleached fibers insures good absorption. These combined properties make for lower production cost in the coloring of papers, where special fastness is not essential.

The highest manufacturing standards have been maintained by the Company and paper dyers can use these products with full confidence that they are equal, and in many instances superior, to any employed heretofore.

Special attention is directed to the following:

National Auramine O P
National Chrysoidines Y P & R P
National Bismarck Browns Y P & R P
National Safranines A P & B P
National Rhodamine B P
National Fuchsine N B P
National Basic Kraftbrown N A C
National Methyl Violets B B P & B B P Conc.
National News Blues
National Victoria Blue B P
National Methylene Blue B B P
National Victoria Green W B P Crystals
National Brilliant Green B P
National Basic Black N A C

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THE FIRST AND LARGEST MAKERS OF COAL-TAR DYES IN AMERICA

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Tell your Agents they can guarantee your goods:
To be a permanent white;
not to have been weakened;
to be soft and elastic;
to be free of chemicals and odor.
Ask us to teach you how to Peroxide-bleach by which alone these qualities are obtained.

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"NATIONAL" NEWS

OF INTEREST TO DYERS AND THE COLOR USING INDUSTRIES IN GENERAL

Prepared by the

NATIONAL ANILINE & CHEMICAL COMPANY, INC.

For Prompt Shipment

National
Superchrome Garnet Y
Superchrome Red B

These two important chrome reds are especially recommended for all classes of woolen and worsted goods where fastness to light, washing, fulling, potting or carbonizing is demanded. They are level-dyeing and penetrate easily.

Send to any of our branch offices for Special Bulletin showing samples of dyeings made by the after chrome method with directions for use on yarn, piece goods and raw stock; also for silk stripe effect worsteds.

Mode Shades for Ladies' Dress Goods

"National" Offers Novel Shade Card Featuring Popular Blends for Spring

The Dye Application Division of the "National" has prepared for distribution a timely shade card containing a palette of seven standard National dyes, and accompanying this, forty-eight combination mode shades produced by the use of the colors on this palette. These cover a wide range from the delicate corn and straw yellow up to the bloomy russets and navys.

It is the mauve and lavender shades which are going to be in the greatest demand during the coming year and these, together with the always popular taupe, sand and smoke effects in the latest variety, are all fully covered in this treatment.

Directions for the preparation of the dye bath and the method of dyeing are given and exact information, expressed in pounds and ounces, is provided, showing how each one of these forty-eight shades is produced by an intelligent use of the palette.

Spring Colors for Sports Material

Shades Designated Are as Shown on the Spring Card Issued by the Textile Color Card Association

On Silk

Spring Beauty *Appleblossom* *Venice*
Periwinkle *Serpentine* *Canna*
Canary *Rubelite* *Wood Violet*
Bermuda *Flame* *Sand*
Pumpkin *Silver*

On Wool

Saratoga *Newport* *Hollywood*
Meadow Brook

Among the "National" dyes for producing these shades are the following:

National Fast Fuchsine 6B
National Wool Orange A Conc.
National Alphazurine A
National Alphazurine FG
National Alphazurine 2G
National Acid Fast Violet BG
National Azo Yellow A5W
National Fast Red S Conc.
National Fast Crimson GR
National Rhodamine B
National Croceine Scarlet Moo
National Wool Yellow Extra Conc.
National Wool Orange 2G Crystals
National Alizarine Sapphire FS
National Wool Green S

Write our nearest branch office for a copy of "Dyer's Formulas," which will explain how these shades may be duplicated with "National" dyes.

How Can the Dye Manufacturer Best Serve You?

By Co-operation in Solving the Technical Problems That Confront You in the Application of Color

The National Aniline & Chemical Company, Inc., maintains a technical application division composed of a staff of color experts having at their disposal complete laboratory facilities for the practical solution of color problems.

Ths technical service, which is freely offered to the Company's customers, covers all matters pertaining to the accurate application of "National" Dyes. It includes the analysis of materials prior to the application of color and the selection of dyes suitable for these materials; the best methods of obtaining, in different classes of fabrics, new shades that are popularized by fashion; and all other problems that constantly arise in dyeing operations.

Dyers' Percentage Table

This useful chart has been prepared to help the dyer figure his percentages accurately and quickly. It is a practical time saver. Printed on heavy, waterproofed cardboard. Will be sent on request. Address Publicity Division—21 Burling Slip.

National Aniline & Chemical Company, Inc.

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THE FIRST AND LARGEST MAKERS OF COAL-TAR DYES IN AMERICA

NATIONAL DYES

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UNITED STATES COLOR AND CHEMICAL CO. INC.

Anthranol Chrome Blue Black AR

Dyes chrome mordant or top chromed. Recommended for fast shades of navy blue or all classes of stock. On account of its shade, level dyeing properties and solubility it is especially suitable for piece dyeing

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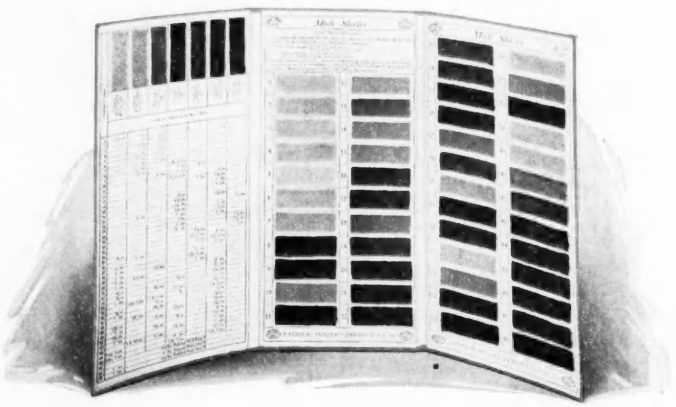

Dyed in the Piece

A timely "National" shade card is ready for distribution containing 48 dyeings of ladies' dress goods and coatings, featuring popular shades for spring.

A palette of seven standard National acid dyes suitable for piece dyeing is given, and accompanying this is a group of dyeings showing combination mode shades produced by the use of the colors on this palette. These cover a wide range from the delicate corn and straw yellow up to the bloomy russets and navys.

It is the mauve and lavender shades which are going to be in the greatest demand during the coming year and these, together with the always popular taupe, sand and smoke effects in the latest variety, are all fully covered in this treatment.

Directions for the preparation of the dye bath and the method of dyeing are given and exact information, expressed in pounds and ounces, is provided, showing how each shade is produced by an intelligent use of the palette.

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New York *Chicago* *Charlotte* *Toronto* *Philadelphia*
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"National" News

OF INTEREST TO DYERS AND THE COLOR USING INDUSTRIES IN GENERAL

Prepared by the

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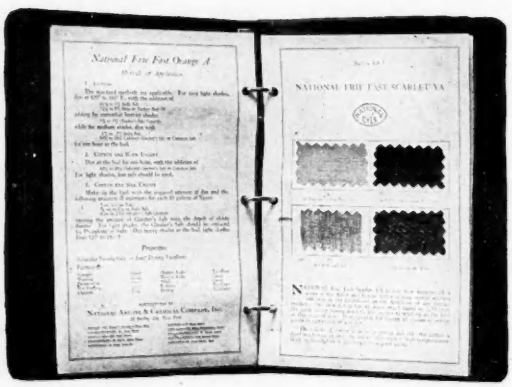

What Evidence of Progress Is Most Valuable to Dye Users?

Prompt Advice and Practical Information on the Character and Properties of the New Dyes.

New Dye Bulletins are a Feature of "National" Service

When a new dye is developed and released to the trade as an established "National" product a special bulletin is simultaneously issued.

This places in the hands of the dyer a brief description of the color, illustrated by swatches, showing several dyeings on appropriate fabrics, together with detailed and practical instructions as to the method of application; and a tabulation of the properties of the new dye based on laboratory tests.

The bulletins are issued in loose-leaf form to fit a special binder, for ready reference by the dyer. From time to time all the "National" products are incorporated in the standard color cards issued by the Company. But this important advance information is given to the trade through the prompt distribution of these New Dye Bulletins.

This is merely one item in the whole program of development and it is illustrative of the "National" idea of practical service based on an understanding of the dye user's requirements.

National

Naphthol A S

RAPID FAST DYES FOR COTTON WHEN DIAZOTIZED AND DEVELOPED WITH

National Red Developer P

National Blue Developer D

National Scarlet Developer O

For details and complete information apply to any of our branch offices.

Our House Organ "Dyestuffs"

This is a monthly digest of interesting and informative articles appearing in various domestic and foreign trade journals, of interest to the users of dyestuffs. An effort is made to give special, though not exclusive, attention to a specific subject, and among the more recent issues Silk, Jute and Linen have been specially treated, while the current number for March refers particularly to Sir William Henry Perkin, this being the month in which he was born, and in which, also, he made his discovery of the first coal-tar color. Here, for instance, are the leading articles appearing in the last few issues of "Dyestuffs"—

NOVEMBER

History of Textiles in the New World (illustrated)

DECEMBER

Dyes and Wearing Apparel

JANUARY

An Old Chinese Story of the Origin of Silk (illustrated)

FEBRUARY

Jute Dyeing
Value and Balance in Color

MARCH

The Rapid Fast Dyestuffs
Dyeing Worsted Fabrics

Upon request we will be glad to send copies of "Dyestuffs" to those interested.

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to the
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with

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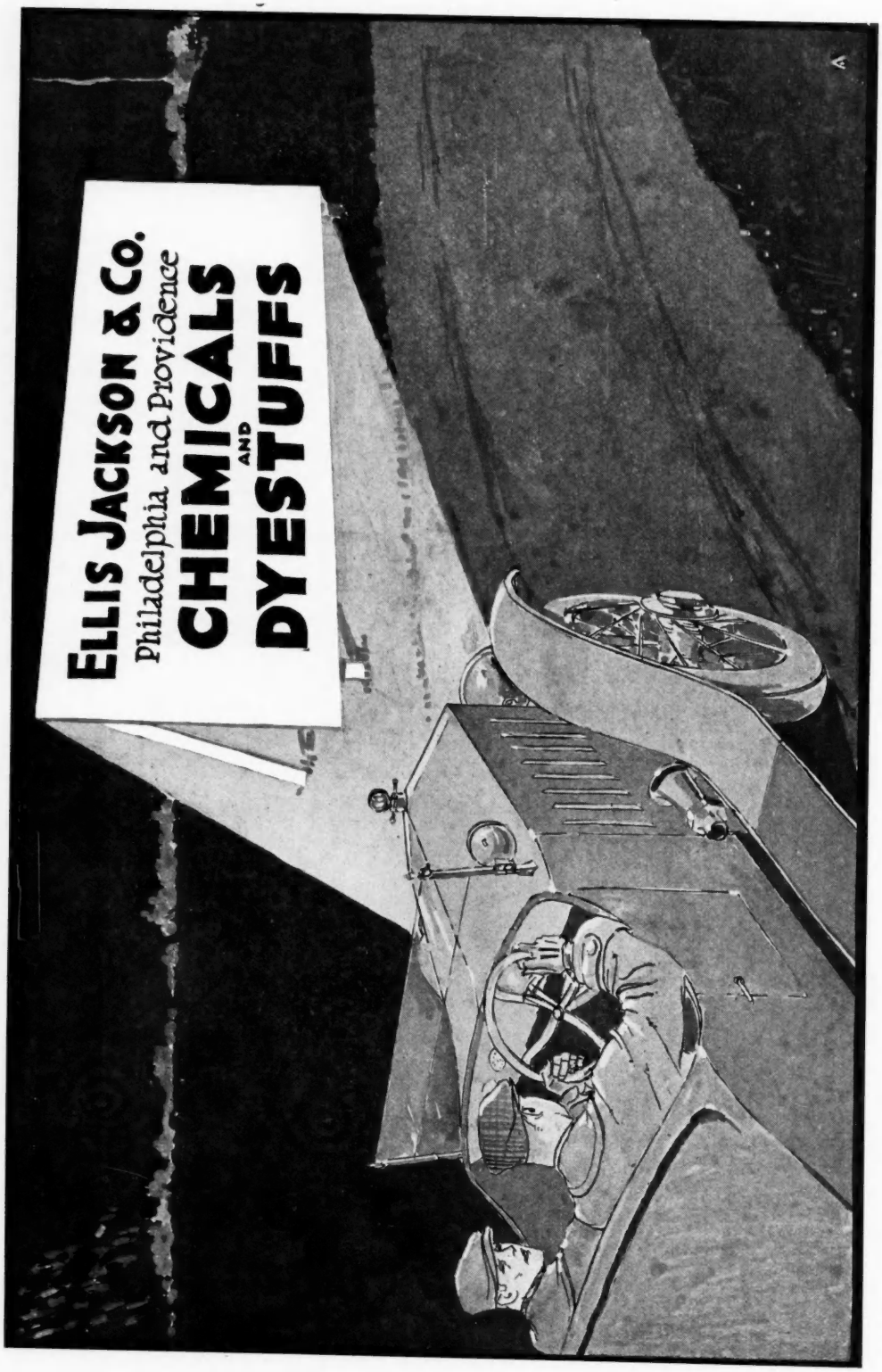
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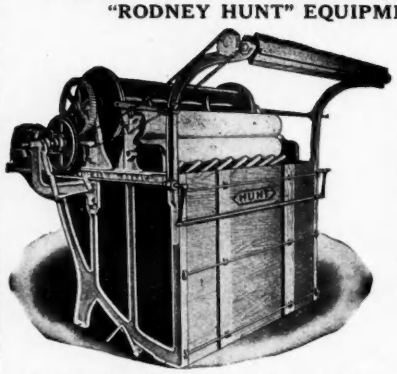

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We call particular attention to

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This is a new edition of a former volume by the same author. entitled "Chemistry of Dyestuffs," and has been thoroughly revised and brought down to date by Dr. Eugene Grandmougin—translated by Frederick A. Mason. The new edition describes minutely the chemical properties of all dyestuffs, including the natural colors, and contains particularly a new chapter on the Vat Colors

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An introduction to the examination, valuation and application of the most important substances used in dyeing, printing, bleaching and finishing. Translated by Arthur C. Wright. Second edition, revised and enlarged by H. B. Stocks. **PRICE $3.00**

HOWES PUBLISHING CO.
4109 Woolworth Building NEW YORK CITY

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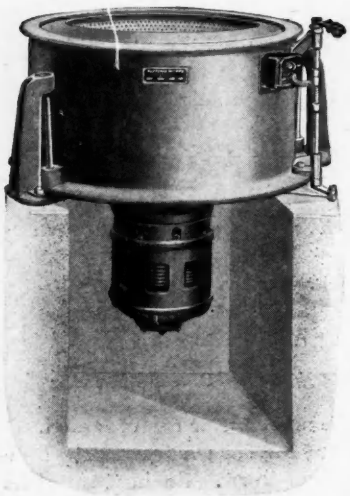

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TEXTILES PAPER LEATHER

AMERICAN DYESTUFF REPORTER

Including the Proceedings of the
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME IX JUNE 19, 1922 NUMBER 13

FEATURES OF THIS ISSUE

"Suggested Method for Filing Sample Dyeings," by E. W. Adams, tells how one mill worked out a convenient system for ready comparisons.

Color chemists should find extremely useful a "Cross-Index of Green-Schultz and Schultz-Green Numbers" prepared for use in the Color Laboratory, U. S. Bureau of Chemistry.

Proceedings of the A. A. T. C. C. include the Research Committee's provisional method on fastness to washing, soaping, laundering and fulling of dyed and printed cotton against white cotton.

Three alumni papers from the Philadelphia Textile School are: "Dyeing Wool as Raw Stock," "Warp Yarn Mercerizing," and "The Padder in the Dyeing of Cotton Piece Goods."

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PAINTS INKS RUBBER

Old Man "Good Enough" Sees the Handwriting on the Wall

OLD MAN GOOD ENOUGH was the offspring of Textile Prosperity and the parent of Waste and Inefficiency. He was old looking and infirm even at birth, but his parent Prosperity said he was "Good Enough."

Textile Prosperity pampered and stuffed Good Enough until he grew fat and more spoiled and shiftless than ever. Good Enough wasted his parent's earnings recklessly, shamelessly, thousands and thousands of dollars a year.

Quietly and unobtrusively he slunk out of the door and has not been seen since.

People warned Textile Prosperity regarding Good Enough's recklessness, pleaded with him to cast out the prodigal son. They pointed to Efficiency, a one time acquaintance of Textile Prosperity, and said, "Make him your favorite. He can save you thousands of dollars which Good Enough is now wasting." But Textile Prosperity turned a deaf ear to all these pleadings, and answered with a smug smile, "I'm making lots of money. I guess Good Enough is 'good enough for me.'"

But there came an end. Textile Prosperity sickened from too much of everything and died. He was succeeded by Depression, who remained in authority for many months and who still pampered Good Enough, partly from precedent and partly because he was too weak to do otherwise

Then Efficiency, who had been growing weak from neglect and inactivity, began to realize the great need for his guiding hand and by an heroic effort pulled himself together and took command. He assembled about him those who had previously advised Textile Prosperity in vain and found in their words much that was good; particularly from one named Franklin Process:

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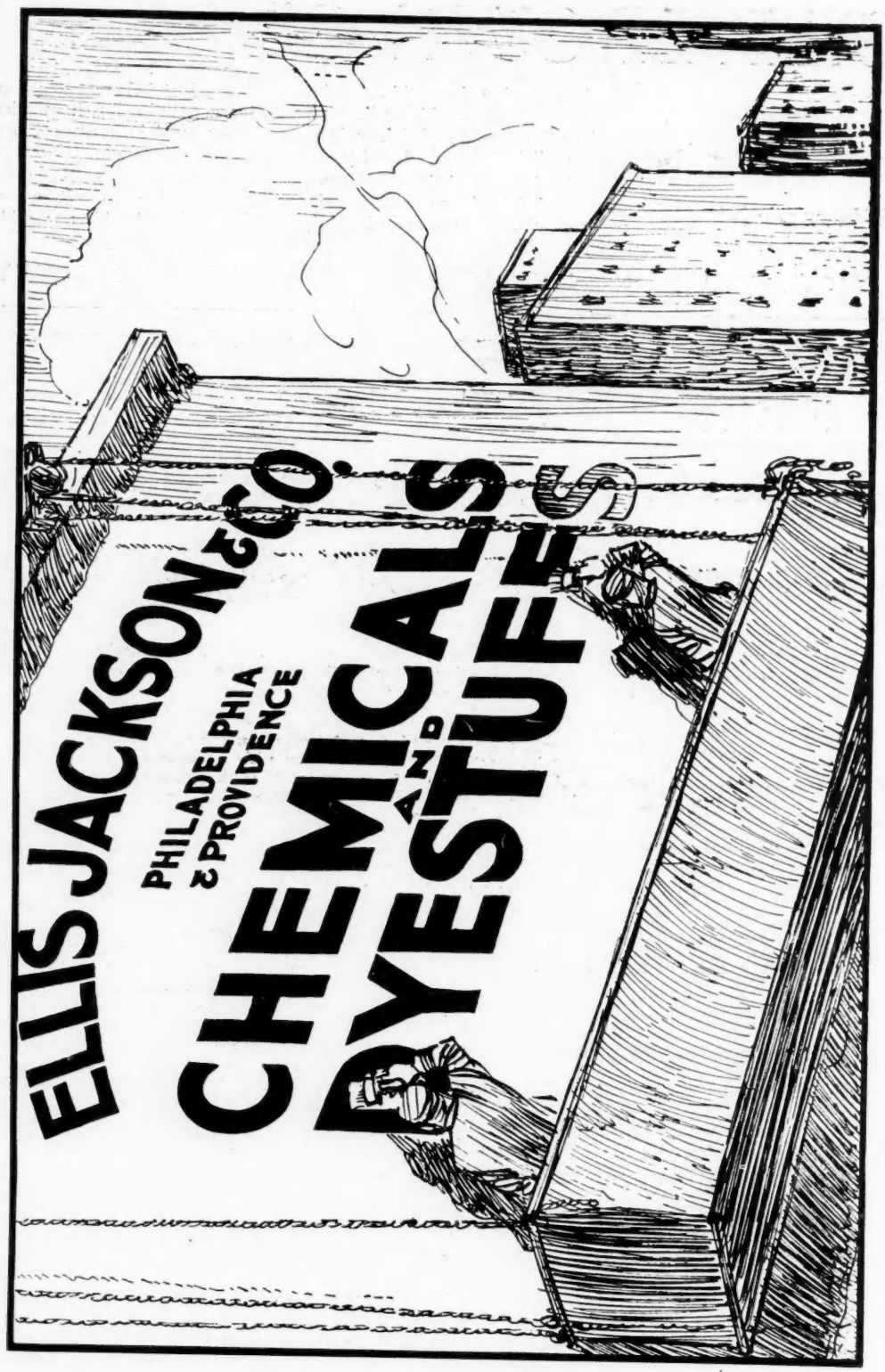
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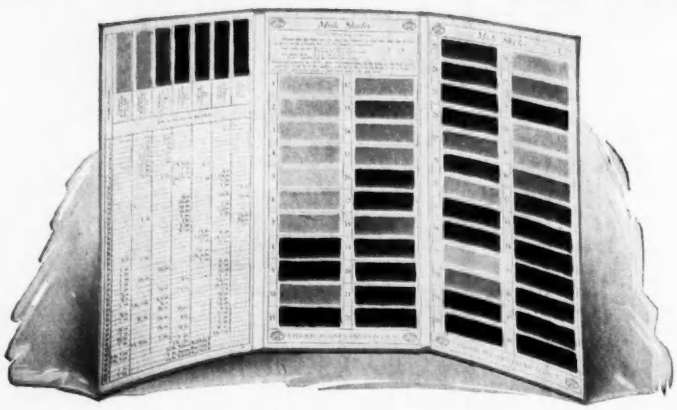

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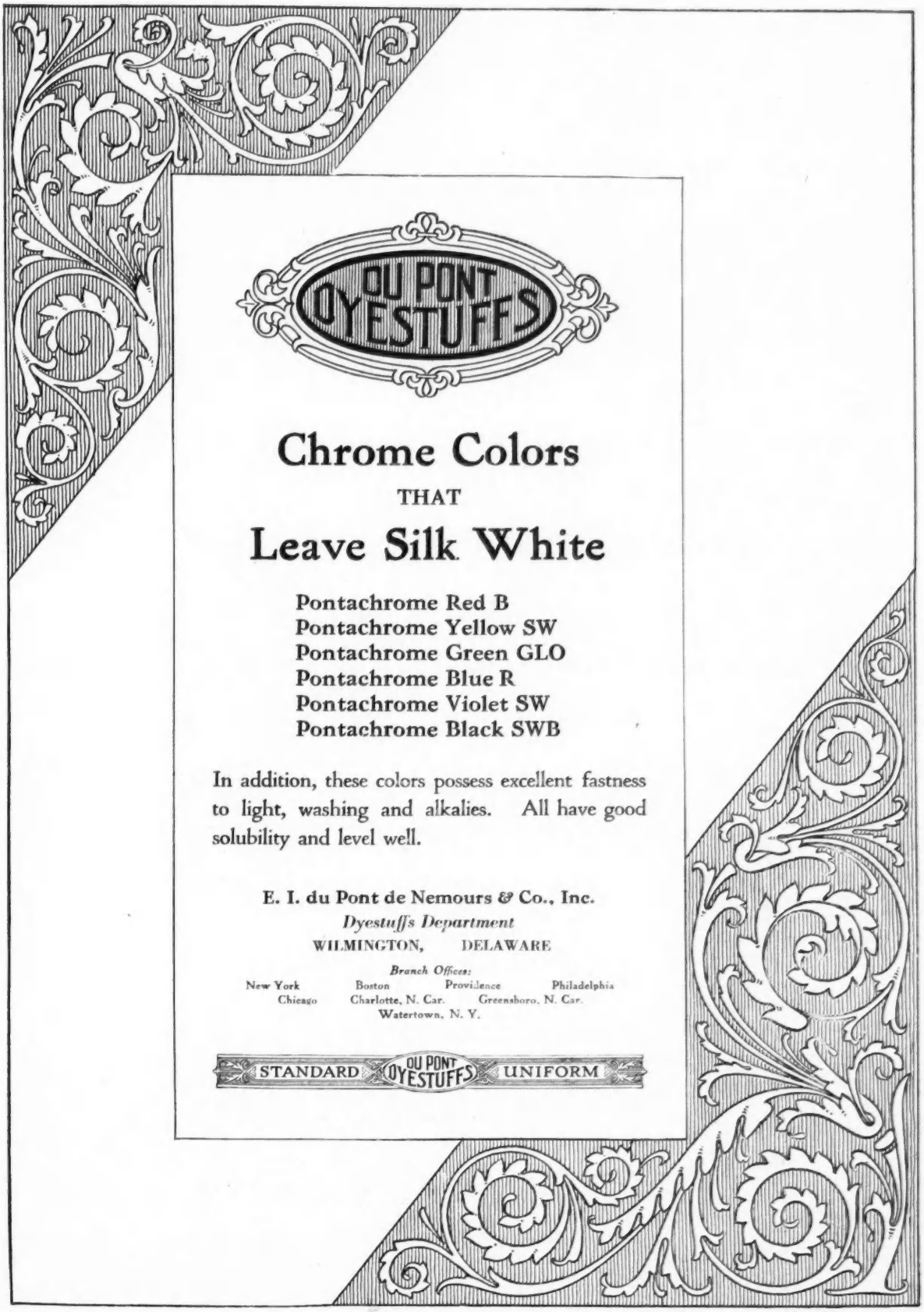

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